

On porcelain and stoneware

Thin the glaze with an equal amount of water or Thin 'n Shade. Apply to witness cone 04 bisque. Fire to the porcelain/stoneware manufacturer's direction to recommended high-fire cone (cone 4-5-6). Be sure to dryfoot the piece. On high-fire ware, Antique Glazes change dramatically in color. To determine the high-fire appearance of any glaze, test-fire a small sample on the particular porcelain or stoneware body you plan to use. (See the "Color Information Index" in the Duncan Color Selection Guide for high-fire color descriptions.)

Brush and product care

Clean brushes with water. Wipe rims of jars and insides of lids, then close tightly.

Art Glazes

Characteristic 3

Some of these glazes are glossy with two or three color tones, some have uneven or rough textures, while others are a matte. The excitement and charm of Art Glazes is that no two firings will give exactly the same results. The thickness of glaze application and the shape of the article influence the end result. Not only are Art Glazes beautiful when used alone, they produce fascinating finishes when used in combination with other glazes.

Application

To witness cone 04 bisque, apply 3 flowing coats unless otherwise stated on jar label. Allow to dry. Fire to witness cone 06. Thin with water or Thin 'n Shade if-needed.

Over underglazes

The transparent (colored) Art Glazes can be used successfully over underglazes, but their color may change the colors of the underglazes. Test-fire a small sample to be sure of satisfactory results.

On porcelain and stoneware

Thin the glaze with an equal amount of water or Thin 'n Shade. Apply to witness cone 04 bisque. Fire to the porcelain/stoneware manufacturer's direction to

recommended high-fire cone (cone 4-5-6). Be sure to dryfoot the piece. On high-fire ware, Art Glazes change dramatically in color. To determine the high-fire appearance of any glaze, test-fire a small sample on the particular porcelain or stoneware body you plan to use. (See the "Color Information Index" in the Duncan Color Selection Guide for high-fire color descriptions.)

Brush and product care

Clean brushes with water. Wipe rims of jars and insides of lids, then close tightly.

Crackletone Glazes

Characteristics

Crackletone Glazes are formulated to crackle in interesting patterns. Crackletones are decorative glazes and are not recommended for use on food containers or any piece designed to hold water. By their very nature, they are not waterproof. One more point — avoid placing any glaze, crackling or noncrackling, on the inside of the piece. Crackletone Glazes should be applied only to the outside surfaces of ware such as lamp bases, bookends, figurines and vases for dried and silk flowers, to avoid the possibility of the piece cracking during the firing and cooling periods.

Application

Apply 2 flowing coats to witness cone 06 bisque, being careful to avoid touching glazed areas, as this may inhibit the crackling. Dryfooting (omitting glaze from bottom of piece) is necessary because it allows the gases in the soft (witness cone 06) bisque to escape. Allow to dry, and fire to witness cone 06. Thin with water or Thin 'n Shade if needed.

Note: The glaze begins to develop its crackle pattern while cooling in the kiln and will continue to increase long after the piece has been fired. Wait about 48 hours until the crackle pattern has reached the degree you like — then stain to bring out and accent the crackles. India ink is good and so are the darker or stronger tones of Duncan Bisq-Stain Opaques. Rub in the staining material and wipe or wash away the excess. It is interesting to note how the effect of a glaze changes when different colored

stains are used.

Over underglazes

Transparent Crackletone Glazes can be successfully used over most underglazes.

Brush and product care

Clean brushes with water. Wipe rims of jars and insides of lids, then close tightly.

Crystallone Glazes

Characteristics 950907 CWE 727

The finished results of this group of glazes will vary according to the spacing of crystal application and the shape of the article to which they are applied.

Note: When you open a jar of some Crystallone Glazes, you will see that the crystals are at the bottom. This is normal. (The exceptions are the Confetti, Crystal Clear and Enamelware Crystallones.)

Application

Stir glaze without disturbing crystals. To witness cone 04 bisque, apply 3 flowing coats in the following manner unless otherwise stated on the jar label. Pour most of the liquid glaze from the jar into a paper cup. Apply the first 2 flowing coats from the glaze in the paper cup. Stir remaining glaze in jar to obtain more control on the distribution of crystals. If your piece does not have enough crystals showing after firing, you can pick up more crystals, apply them to the piece and re-fire. Separate second and third coats of glaze (staggering) at the bottom of the piece by fractions of an inch (normally, 1/8" to 1/4" for second coat; 1/4" to 1/2" for third coat). This prevents the crystals from slipping off the ware during the glaze firing and puddling at the base. Fire to witness cone 06.

On porcelain and stoneware

Thin the glaze with an equal amount of water or Thin 'n Shade. Apply to witness cone 04 bisque. Fire to the porcelain/stoneware manufacturer's direction to recommended high-fire cone (cone 4-5-6). Be sure to dryfoot the piece. On high-fire ware, Crystallone Glazes produce some of the most unusual

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Glazes

950907 CWB 727
950907 CWB 727

and exotic effects. Most of them change greatly; all that contain red or orange crystals lose the reds, yet produce an interesting finish. The high temperature produces a very fluid pattern. To determine the high-fire appearance of any glaze, test-fire a small sample on the particular porcelain or stoneware body you plan to use. (See the "Color Information Index" in the Duncan Color Selection Guide for high-fire color descriptions.)

Brush and product care

Clean brushes with water, being careful to rinse out any crystals. Wipe rims of jars and insides of lids, then close tightly.

Glaze Crystals

Characteristics

Glaze Crystals are to be used in combination with Duncan glazes and can produce many different effects: overall coverage, trims, patterns and designs. The different colors and sizes of Glaze Crystals can be used together as desired, and Glaze Crystals can also be added to any Crystalstone Glaze to vary the effect. By using Glaze Crystals with Duncan glazes, you can create glazes that are yours alone, for uniquely decorated ceramics. Crystals, like glazes, change their color when fired, depending on the glaze used. To be sure of satisfaction, make a small fired test piece before proceeding with a larger project.

Application

Apply 2 coats of your chosen glaze to witness cone 04 bisque. Mix the Glaze Crystals (the quantity depends on the effect desired) with enough of the same glaze for the third coat.

Use one crystal color or mix the different colors and sizes of Glaze Crystals.) Crystals flow in firing, so do not place them close to the outside bottom of the ware. Fire to witness cone 06.

Special effects

After applying 3 coats of glaze to witness cone 04 bisque: (1) Moisten some crystals or a combination of crystals in a container with some of the same glaze. Using a brush or weezers, place the moistened crystals on the rim of the ware (vase, bowl, or

similar piece), or apply them in a pattern or design. (2) Dramatic effects can be accomplished by placing a cluster of crystals in one area for a splash of color, or arrange several different crystals on a flat-surfaced piece for an abstract painting effect. (3) Take advantage of design areas on flat pieces and create crystal inlay effects. Fired pieces with blemishes or specks can sometimes be salvaged by applying Glaze Crystals with the same color glaze or with a contrasting glaze. Fire to witness cone 06.

Note: Glazes and crystals, when mixed together or applied over one another, combine chemically and may produce a finish which is not safe to use on surfaces that come in direct contact with any food or drink.

On porcelain and stoneware

Thin the desired glaze with an equal amount of water or Thin 'n Shade, then mix in the Glaze Crystals. Apply to witness cone 04 bisque. Fire to the porcelain/stoneware manufacturer's direction to recommended high-fire cone (cone 4-5-6). Be sure to dryout the piece. On high-fire ware, Glaze Crystals produce different effects depending on the glaze with which they are mixed. The high temperature produces a very fluid pattern. To determine the high-fire appearance of any glaze, test-fire a small sample on the particular porcelain or stoneware body you plan to use.

Brush and product care

Clean brushes with water, being careful to rinse out any crystals. Wipe rims of jars and insides of lids, then close tightly.

Dimensions Textural Glazes

Characteristics

Dimensions Glazes are different from other glazes because they can be applied to either greenware or bisque. These glazes are not waterproof. Dimensions Glazes "breathe"; that is, they are porous. You can apply them to greenware because this porosity allows the gases and moisture released from the greenware during the bisque firing to escape through the glaze. Each Dimensions Glaze is individual; the

crystal may be a slightly different size, shape or color from those of its sister colors. For example, Rust Dimensions Glaze contains a little speck of yellow, while the crystals in Blue Dimensions have a darker blue cast. Dimensions Glazes do not move in the glaze firing, so they are an excellent choice for design work. (See "Tips" for more information.) Dimensions Glazes are opaque; therefore, one color will cover another.



Dimensions Textural Glazes on a duck bookend.

Application

Shake and stir well. Apply 3 flowing coats to smooth or lightly detailed greenware, or to witness cone 04 bisque. Thin with water or Duncan Thin 'n Shade if needed. Be sure to stir the Dimensions Glazes occasionally during use, as the crystals have a tendency to settle to the bottom of the jar. Dimensions Glazes can be brushed on or sponged on. While applying a Dimensions Glaze, place a facial tissue between your hand and the ware to avoid knocking off the crystals.

Because of their texture, the nontoxic Dimensions Glazes are not recommended for use on surfaces which come into contact with food or drink. Since Dimensions Glazes are not waterproof, they should not be rolled inside containers, even on a nonfood-contact surface. To use a Dimensions Glaze on a mug roll a complementary dinnerware-safe glaze inside and apply 3 flowing coats of the Dimensions Glaze to the outside. Butt Dimensions Glazes right next to each other; they do not require any space left between the colors.

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Dimensions Glazes can be butted against a Gloss Glaze or another type of flowing glaze, again without leaving any space between colors.

Avoid excessive handling. As with any glaze containing crystals, some crystals will automatically fall off but not enough to affect the outcome of the project. Each Dimensions Glaze contains plenty of crystals. Handle the ware with the least movement possible. The ware can be placed on a banding wheel or turntable to reduce the need to handle while glazing.

As background for underglaze design work

E-Z Strokes, Cover-Coats and Design-Coats can be applied in design over unfired Dimensions Glazes. These underglazes should be thinned to a workable consistency when used in this manner. (No heavier than cream consistency for E-Z Strokes; at least an equal amount of the thinning agent for Cover-Coats and Design-Coats.)

As background for Red-Coat design work

To use Red-Coat opaque underglazes in design work on Dimensions Glazes, follow these steps. (1) Apply the Dimensions Glaze to greenware. (2) Bisque fire to witness cone 04. (3) Apply the Red-Coat color or colors over the fired glaze and allow to dry thoroughly. (4) Apply a clear glaze over the Red-Coat areas. (5) Glaze fire to witness cone 06.

Firing

Textured look: For bisque (witness cone 04) application: glaze fire to witness cone 06. This firing will give a very matte (almost rough) finish. It will be slightly rougher to the touch than the cone 04 finish.

Smoother textured look: For greenware application: bisque fire to witness cone 04. This firing will give a slight textured finish. *Dryfooting* (omitting glaze from the bottom of the piece) is recommended for a greenware application. (See "Tips" for further information.)

Overglaze compatibility

Not all the Dimensions Glazes are compatible with overglazes such as

Bright Gold or Mother-of-Pearl. We advise that a small test-sample be made before proceeding with the actual project. Please note that Rust Dimensions Glaze is not compatible with overglazes (check the label). Bright Gold and White Gold are fired to witness cone 019; Mother-of-Pearl is fired to witness cone 020.

On porcelain and stoneware

Thin the glaze with an equal amount of water or Thin 'n Shade. Apply to witness cone 04 bisque. Fire to the porcelain/stoneware manufacturer's direction to recommended high-fire cone (cone 4-S-6). Be sure to dryfoot the piece. Dimensions Glazes work well on high-fire ware; the results are unique. To determine the high-fire appearance of any glaze, test-fire a small sample on the particular porcelain or stoneware body you plan to use. (See the "Color Information Index" in the Duncan Color Selection Guide for high-fire color descriptions.)

Brush and product care

Brushes and sponges used with Dimensions Glazes should be thoroughly washed with water after use. Check for any remaining crystals. Sometimes a small crystal can become lodged in the metal ferrule of the brush. Wipe rims of jars and insides of lids, then close tightly.

Tips

1. Dimensions Glazes can be applied to witness cone 04 bisque and refired to a witness cone 04 for use with Specialty Products, such as SY 553 Antique Brass and SY 554 Antique Bronze.
2. Dimensions Glazes do not flow in the firing; therefore, they sgraffito nicely on either greenware or bisque.
3. To avoid mud cracking (fine cracked lines in the detailed surface of the glaze after firing), do not allow the glaze to collect in creviced areas. Brush any excess Dimensions Glaze out of the detail during application or go over such areas with a dampened brush.
4. To avoid ridges or brush marks appearing in the surface of the fired Dimensions Glaze, sponge on the glaze or thin the glaze slightly and work the brush back

and forth over the glaze to brush out the ridges.

5. When loading Dimensions-glazed items in the kiln, be sure not to knock the ware against other pieces and be careful not to knock the crystals off. If any crystals do fall onto the kiln shelf, use a damp sponge to wipe them up before firing. Make sure that your kiln shelves are properly kiln washed, that you follow the general firing procedures for any item, and that you clean the kiln shelves regularly.
6. If a Dimensions-glazed piece is to be glazed and fired again, the Dimensions' Glaze can then be applied to the bottom of the piece and stilted for the second firing.
7. If a Dimensions-glazed piece has been dryfooted and is not to be reglazed, yet it is desirable to have color on the bottom for a finished look, apply a complementary Bisq-Stain Opaque color or a piece of felt to the bottom of the item.
8. Applying a Dimensions Glaze to the bottom of a bisqued piece and not stiling will cause the glaze to pick up kiln wash and result in an undesirable appearance.
9. Wiping the crystals off the bottom of the ware before firing does not work and is not recommended.

Gallery Opaque Glazes



Gallery Opaque Glazes.

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Glazes

Characteristics

These glazes have been especially developed for total opaque coverage on large, smooth surfaces, like lamps, vases and dinnerware. The colored Gallery Opaques are excellent for solid-color designs created by butting the glazes. Black and White Gallery Opaques are not recommended for butting techniques.

Application

Apply to witness cone 04 bisque. Use a large glaze brush to apply 3 flowing coats if you are a heavy glazer or 4 flowing coats if you are a light glazer. If you are unsure, try 3 coats and if your piece is a bit streaky after firing, apply a fourth coat over the piece and refire. Apply smoothly to prevent drips. Fire to witness cone 06. Thin with water or Thin 'n Shade if needed.

On porcelain and stoneware

Thin the glaze with an equal amount of water or Thin 'n Shade. Apply to witness cone 04 bisque. Fire to the porcelain/stoneware manufacturer's direction to recommended high-fire cone (cone 4-5-6). Be sure to dryfoot the piece. On high-fire ware, Gallery Opaque Glazes change dramatically in color. To determine the high-fire appearance of any glaze, test-fire a small sample on the particular porcelain or stoneware body you plan to use. (See the "Color Information Index" in the Duncan Color Selection Guide for high-fire color descriptions.)

Brush and product care

Clean brushes with water. Wipe rims of jars and insides of lids, then close tightly.

Lo-Sheen Glazes

Characteristics

These glazes produce matte or satin finishes. The transparent Lo-Sheens give underglaze design work a more muted color effect. **(Note: Lo-Sheen Glazes are not recommended for use over Design-Coats.)** Because Lo-Sheen Glazes stay where they are placed, moving very little in the glaze firing, they are an excellent choice for creative design work and controlled glazing techniques.



Lo-Sheen Glaze — majolica technique.

Application

To witness cone 04 bisque, apply 3 smooth coats unless otherwise indicated on jar label. Apply in one direction. These glazes flow very little in the glaze firing, so apply the glaze as evenly as possible, using as large a brush as the object will permit. Allow to dry thoroughly. Fire to witness cone 06. Thin with water or Thin 'n Shade as needed.

Over underglazes

Transparent Lo-Sheen Glazes can be successfully used over underglazes, with the exception of the Design-Coats.

On porcelain and stoneware

Thin the glaze with an equal amount of water or Thin 'n Shade. Apply to witness cone 04 bisque. Fire to the porcelain/stoneware manufacturer's direction to recommended high-fire cone (cone 4-5-6). Be sure to dryfoot the piece. On high-fire ware, Lo-Sheen Glazes change dramatically in color and surface characteristics. To determine the high-fire appearance of any glaze, test-fire a small sample on the particular porcelain or stoneware body you plan to use. (See the "Color Information Index" in the Duncan Color Selection Guide for high-fire color descriptions.)

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Brush and product care

Clean brushes with water. Wipe rims of jars and insides of lids, then close tightly.

Red-Stroke@ Glaze

Characteristics

Especially formulated, RG 380 Red-Stroke Clear is the only glaze we recommend for use over Red-Stroke translucent underglazes, except for GL 100 Clear Brushing. Do not substitute any other glaze, as this will cause the Red-Stroke colors to turn grey. Red-Stroke Clear is not limited to coverage of Red-Stroke design work. This glaze is effective over most Duncan underglaze colors. However, it should be noted that some underglaze colors cannot be used under this glaze as they will change color radically. Check underglaze labels for the statement: DO NOT USE WITH RG SERIES GLAZES.

Application

Apply 2 flowing coats of Red-Stroke Clear to witness cone 03 bisque or over underglaze design work done on witness cone 03 bisque, allowing to dry between coats and before firing. When glazing design work accomplished with Red-Strokes together with other Duncan underglazes, remember to apply Red-Stroke Clear over the entire piece, not just the Red-Stroke underglaze areas. Thin with water or Thin 'n Shade if needed.

Note: For application over unfired E-Z Strokes used with Red-Strokes, pat on or lay on 1 coat of Red-Stroke Clear and allow to dry. Apply a second flowing coat, again allowing to dry before firing. Fire decorated and glazed witness cone 03 bisque to witness cone 06.

Brush and product care

Clean brushes with water. Wipe rim of jar and inside of lid, then close tightly.

Stonewashed" Glazes

Characteristics

These nontoxic semiopaque glazes offer a range of soft, muted colors

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Glazes

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On porcelain and stoneware

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These glazes produce satin-smooth finishes. They produce uniform coverage on smooth surfaces and are self-antiquing on ware with incised lines or creviced areas. They are excellent for simulated stoneware looks.

brushed out. Apply 3 well-brushed-out coats in one direction to witness cone 04 bisque with a Woodtone brush, using pressure and a long, smooth stroke. Woodtone Glazes must have each coat applied in the

Thin the glaze with an equal amount of water or Thin 'n Shade. Apply to witness cone 04 bisque. Fire to the porcelain/stoneware manufacturer's direction to recommended high-fire cone (cone 4-5-6). Be sure to dryfoot the piece. On high-fire ware, Woodtone Glazes produce a glossy finish. Natural woodtone colors lighten one to two shades, yet a softened wood-grain effect is retained if the graining pattern is strongly visible before firing. To determine the high-fire appearance of any glaze, test-fire a small sample on the particular porcelain or stoneware body you plan to use. (See the "Color Information Index" in the Duncan Color Selection Guide for high-fire color descriptions.



Stonewashed Glazes.

Application

Shake and stir well. To witness cone 04 bisque, apply 3 flowing coats. Stir occasionally during use. Fire to witness cone 06, Thin with water or Duncan Thin 'n Shade if needed. Clean brushes with water.

Brush and product care

Clean brushes with water. Wipe rims of jars and insides of lids, then close tightly.

Woodtone Glazes

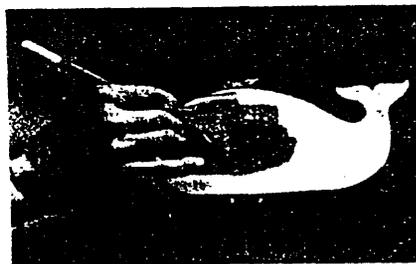
Characteristics

These glazes produce satiny finishes with darker graining for the natural appearance of wood. Designs or scenes can be painted over unfired Woodtones, using E-Z Stroke translucent underglazes. In the jar, Woodtone Glazes are thicker than other Duncan glazes and have a jelly-like consistency.

Application

Do not shake jar or stir, as this will disturb the specks suspended in the glaze. Do not thin to normal brushing consistency. If the glaze needs thinning, place a small quantity on a palette and dip the brush in water before loading. The water in the brush will thin the glaze as it is

same direction. Each coat must be thoroughly brushed out to a thin, even layer. The specks in the glaze are broken and pulled into streaks with a pressure stroke as the glaze is applied. (Note: If the specks are not broken and pulled into streaks, they may pop in the firing, producing more of a distressed and/or wormwood effect.) Woodtone Glazes must be applied as evenly as possible to prevent ridges or bubbles. Do not overbrush as this will muddy the grained look. Fire to witness cone 06.



Woodtone Glaze application.

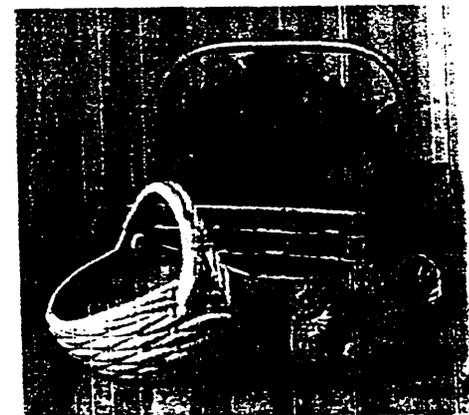
Over underglazes

While Woodtone Glazes are opaque and are not recommended for use over underglazes by themselves, beautiful effects over medium to dark underglaze colors can be achieved by applying 1 coat of a Woodtone Glaze over underglaze design work, followed by 2 coats of a transparent Lo-Sheen Glaze.

Gloss Glazes

Characteristics

Duncan Gloss Glazes are carefully formulated to give consistently beautiful, true-color, high-gloss finishes and outstanding brushability for ease of application. The Gloss Glazes provide a very wide range of colors and a variety of color depth: opaque, semiopaque, transparent (colored), and clear. (See definitions on pages 9-10.) Their uses are equally extensive, from a clear or transparent finish used over underglaze design work to solid-color coverage.



Gloss Glazes.

Glazes

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Application

To witness cone 04 bisque, apply 3 flowing coats unless otherwise stated on jar label. Allow to dry thoroughly, and fire to witness cone 06. Thin with water or Thin 'n Shade if needed.

Over underglazes

Clear Gloss Glazes are the first choice of ceramists as the covering glaze for their underglaze design work. While transparent (colored) Gloss Glazes can be used over underglazes, their color may change the colors of the underglazes. Test-fire a small sample to be sure of satisfactory results.

On porcelain and stoneware

Thin the glaze with an equal amount of water or Thin 'n Shade. Apply to witness cone 04 bisque. Fire to the porcelain/stoneware manufacturer's direction to recommended high-fire cone (cone 4-5-6). Be sure to dryfoot the piece. On high-fire ware, Gloss Glazes change dramatically in color. To determine the high-fire appearance of any glaze, test-fire a small sample on the particular porcelain or stoneware body you plan to use. (See the "Color Information Index" in the Duncan Color Selection Guide for high-fire color descriptions-)

Brush and product care

Clean brushes with water. Wipe rims of jars and insides of lids, then close tightly.

Note: Because Duncan offers several clear Gloss Glazes, the following information should prove helpful in making your selection.

GL 100 Clear Brushing is nontoxic and is the clear glaze Duncan recommends for use in schools and institutions. It is excellent for use over all underglazes. A noteworthy characteristic of this glaze is that it can be used successfully over Red-Stroke translucent underglazes without causing the colors to grey out.

Application: GL 100 Clear Brushing is tinted lavender for ease of application of the recommended 2 flowing coats onto witness cone 03 bisque. (Please note that this glaze has a tendency to craze if applied to

soft bisque.) Glaze fire to witness cone 06.

GL 611 Ultraclear® is an excellent all-around glaze. It is ideal for use over all underglazes, brightening colors and producing a finish of great clarity with little color distortion. It is excellent for decal and gold firings, has an extremely wide firing range (cone 06 — cone 6), and produces a finish of unsurpassed hardness and durability.

GL 617 Clear Brushing is a very easy glaze to use. Because it is very "forgiving," it is an ideal alternative if a beginner has problems with GL 611 Ultraclear. It produces a clear gloss effect that is a desirable finish for underglaze decoration and works well with overglazes and decals. Glaze fire to witness cone 06.

Application: Both Ultraclear and GL 617 Clear Brushing are tinted blue for ease of application, and have a smooth, creamy, homogenized consistency, which makes it easy to brush the recommended 2 flowing coats onto bisque. Should the glaze thicken, carefully add water or Thin 'n Shade, a few drops at a time, until the glaze regains its free-flowing qualities; the addition of too much thinner may cause it to separate in the jar.

GL 618 Blue White Clear Brushing is a little more difficult to use and is recommended to advanced hobbyists. It is one of the clearest glazes on the market today. A higher-than-average firing range provides added protection against overfiring and it is ideal for china painting and metallic overglaze techniques.

Application: Blue White Clear Brushing is a smooth glaze that requires only 1 flowing coat. It is tinted blue for ease of application. Glaze fire to witness cone 06.

Note: Blue White Clear Brushing is unique because only 1 good flowing coat is necessary. It is possible that the first time you use this glaze it might be applied too heavily. If this occurs, little bubbles will appear just under the surface of the glaze. Refire the piece to witness cone 05 of 04 to correct this condition. When using this glaze, or any glaze, remember that, if the first application is too light, apply another coat and refire.

Note: Here's some helpful information about a special glaze that is a longtime favorite with ceramists.

GL 653 Downright White is a very bright white opaque glaze with a glossy finish and is one of the whitest glazes on the market. Because Downright White does not flow during the firing process as the other Gloss Glazes do, E-Z Stroke translucent underglazes can be applied over unfired Downright White applied to witness cone 04 bisque. The thinned E-Z Stroke colors can be applied in design or used for the detailing on figurines. Glaze fire to witness cone 06.

Application: Dust witness cone 04 bisqueware well to prevent crawling. Lightly sponge ware with a water-dampened sponge before applying glaze. If you are not certain that your ware has been properly bisque fired to witness cone 04, you can thin the first coat of Downright White slightly (three parts glaze to one part water or Thin 'n Shade) and scrub it into the ware. This initial "prep coat" will help the glaze bond to the ware better. Finish the glaze application with 2 to 3 coats of undiluted Downright White, depending on whether you are a light or heavy glazer. If you are sure your ware is mature witness cone 04 bisque, simply apply 3 flowing coats straight from the jar. Select the appropriate soft brush for the size of your ware and flow the glaze on smoothly.

Note: If your project (vase, canister, teapot, etc.) calls for glaze inside and out, we recommend using only Downright White. Using two glazes, such as Downright White outside and Ultraclear inside, may cause the ware to split.

'Dip 'n Done™ Quick-Dry Ceramic Finished Ware Glazes

Characteristics

Developed expressly for fast and easy mass production of finished ware. Dip 'n Done Glazes are over 25 times faster than brushing. They are ready to use straight from the container. In some cases, glazes are item,

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Glazes

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no drips. Very quick
can be handled
dipping.

ceramic product
make one or two clear
With Dip 'n Done
can offers colored
glazes in addition to
Some Dip 'n Done colors
available, and Over 100
colors are available by special
through your Duncan Dealer or

water. After this consistency is determined, it can be maintained with water. However, like any other glaze, Dip 'n Done Glazes may thicken if and when evaporation of water from the glaze occurs. if you're using Dip 'n Done Glaze on a cool and/or rainy day, or on a very humid day, little thickening of the glaze will take place. Water evaporates when the weather is hot, dry or windy. If your Dip 'n Done Glaze does thicken, add water as needed and stir well until the glaze is restored to a workable consistency,

any drips from the ware. Before placing the dipped ware on a rack or cart, finger-smooth any drips or runs.



Shake any drips from the ware-as you remove it.

Finger-smooth any drips of runs.

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ue should be properly fired to cone 04. Underfired bisque with too much water from the firing a thicker glaze coat e. Overfired bisque will absorption, resulting in a coat too thin. Make sure glaze is clean — an of particles. Duster



Mixing.

Pouring into dipping tank.

Quick drying

The glazed piece will be dry enough to handle seconds after dipping. The hotter the bisque was fired, the harder it will be and the longer it will take for the ware to dry.

Firing

Fire Dip 'n Done-glazed ware to witness cone 06.



Dust the bisque.

DP 400 Clear Dipping Gloss

Characteristics

DP 400 Clear Dipping Gloss is milled expressly for dipping or spraying.* It has the same qualities as GL 617 Clear Brushing, yet can be used with ease either to glaze the inside of objects or the entire surfaces of those that are to be completely glazed. In spraying, use the glaze as it comes from the bottle; however, water should be added when it is used for dipping. it will take an average of one quart of water per gallon of glaze. The proper application will be determined by you since the amount of glaze collected on the object depends on how quickly the piece is dipped in and out of the glaze as well as the condition of the bisque (a/ways apply to witness cone 04 bisque). The thickness of the glaze is of utmost importance. Normally, it should be about the thickness of a postcard.

*Note: Duncan does not recommend the spraying of lead-based glazes by hobbyists. Before spraying, commercial users should



Mix before dipping and frequently during use.

Use dipping tongs to hold ware.

Dipping

The unique Dip 'n Done formula allows a good, even coat of glaze, at the right thickness, to instantly adhere to the ware and, with Dip 'n Done, there is virtually no dripping. Use dipping tongs (available at ceramics supply shops) to hold the bisque ware. Dip with a smooth motion, using wrist action to turn the ware in the glaze. Do not let the ware touch the side or bottom of the dipping tank, as the glaze coating may be wiped away from contact areas. As you remove the ware from the dipping tank, shake

Duncan Mixing Tool, mix glaze in Dip 'n Done before pouring into dipping clean plastic container makes dipping tank. Or, if you're Dip 'n Done in a 5-gallon size, Dip 'n Done container for a tank. Mix glaze again before frequently during use — 15 to 20 minutes. The bits of each dipping operator body and shape of different ware can cause variables in dipping consistency, generally that of skim or milk. Dip 'n Done Glazes can be used to the best dipping consistency for your needs by adding

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Glazes

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SY 550 Granite Sandstone reproduces the rough texture of stone. It contains quartz particles and *must be thoroughly* mixed before using. Granite Sandstone performs best on **smooth** or lightly detailed pieces.

Application: Shake jar and stir well. To witness cone 04 bisque, apply 3 flowing coats as evenly as possible. Stir occasionally during use. Fire to witness cone 06. Thin with water or Thin 'n Shade if needed.

Note: Due to the rough texture of the fired piece, apply felt to the bottom of the finished piece before placing on furniture or other surfaces.

Brush and product care: Clean brushes with water, being careful to rinse out any quartz particles. Wipe rim of jar and inside of lid, then close tightly.

SY 553 Antique Brass and SY 554 Antique Bronze both produce a rich, polished metal-like finish with a very faint filigree effect. They are very effective for overall coverage and on holiday decorations. (See Dimensions Textural Glazes for information on use with these glazes.)

Application: Apply 3 to 4 flowing coats to witness cone 04 bisque. Thin with water or Thin 'n Shade if needed.

Firing: Antique Brass and Antique Bronze require a hotter glaze firing to witness cone 04.

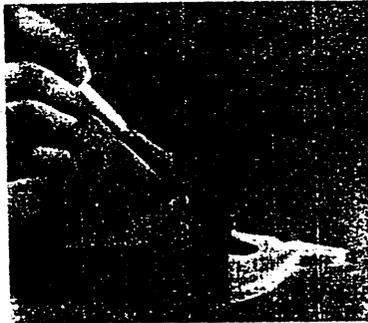
Brush and product care: Clean brushes with water. Wipe rims of jars and insides of lids, then close tightly.

Specialty Products

SY 545 Patch-A-Tatch® is an excellent medium for mending broken greenware or bisque that will be glaze fired. It is also designed as a cement for joining or making attachments to greenware or bisque.

Application: Gently scratch crisscross lines on areas to be joined. Using a soft-brush, moisten scored areas or broken edges with water. Use the same brush to apply a good coat of Patch-A-Tatch to these areas. Quickly attach or fit the pieces together and hold securely for a few seconds. Brush a little Patch-A-Tatch over the joint and, when set and thoroughly dry, scrape, sand, sponge

or otherwise finish, and the piece is ready for decorating or firing.



1. Moisten broken edges with water.



2. Apply Patch-A-Tatch with brush to areas to be joined.



3. Gently fit pieces together and hold in place for a few seconds.



4. Use dampened sponge to smooth any Patch-A-Tatch that may show around the joint.



5. Allow to dry thoroughly, then sand with grit cloth.

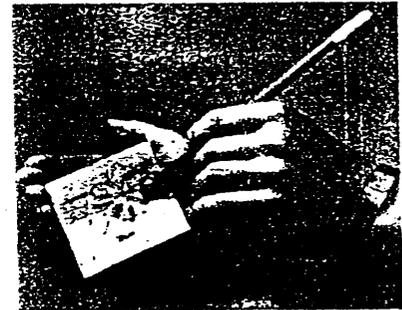
Brush and product care: Clean brushes with water. Wipe rim of jar and inside of lid, then close tightly.

SY 547 Wax Resist is a wax emulsion especially created to repel underglazes and glazes applied over it. The wax is burned off during firing, revealing designs or base colors. Wax Resist is also helpful in preventing chipping and peeling of color when creating sgraffitoed designs through opaque underglaze.

Application: Shake jar and stir well. Always dampen brush or sponge thoroughly with Duncan Hand and Brush Cleaner and squeeze out excess before loading with Wax Resist. Apply 1 good coat of Wax Resist over

greenware, bisque, underglaze or glaze. Allow Wax Resist to dry thoroughly before proceeding with technique. Gently remove excess color from resist areas with a dampened sponge before firing. Fire greenware to witness cone 04 (or to witness cone 03, if using Red-Stroke translucent underglazes). Remove any loose particles of fired underglaze with stiff brush before glazing. Glaze fire to witness cone 06.

For underglaze designs: Apply base coat of underglaze color to greenware. Paint design with Wax Resist over base coat. When design is thoroughly dry, apply contrasting color over the ware. Bisque fire to witness cone 04. After bisque firing, remove loose underglaze particles with a stiff brush before glazing. This technique also works with Design-Coats on bisque or greenware.



Application of color over design protected with Wax Resist.

For glaze designs: Paint designs with Wax Resist directly on witness cone 04 bisque or over 3 coats of dry, unfired glaze applied to witness cone 04 bisque. When Wax Resist is dry, apply 1 coat of a second glaze color over the ware. Fire to witness cone 06.

Brush and product care: Clean brush in Hand and Brush Cleaner and rinse in warm water immediately after use. Wipe rim of jar and inside of lid, then close tightly.

SY 548 Mask 'n Peel® is a water-based emulsion formulated to protect design areas or colors, making application of background or adjoining colors faster and easier. It can be used under or between opaque underglazes, glazes or nonfired acrylic colors, and under translucent underglazes. It is an excellent aid for beginning ceramists.

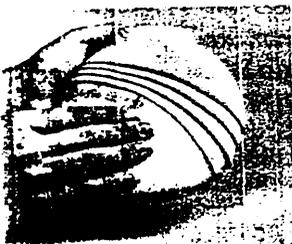
Applications Always dampen brush or sponge thoroughly with Duncan

Glazes

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land and Brush Cleaner and squeeze out excess before loading with Mask 'n Peel. Apply 1 good coat of Mask 'n Peel to desired areas. Allow Mask 'n Peel to dry thoroughly before applying color over it. (Heavy applications of Mask 'n Peel tend to dry on the surface. before drying underneath. When this occurs, the Mask 'n Peel peels off in layers. For this reason, any heavy areas should be checked for traces of Mask 'n Peel before proceeding with the technique. When removing Mask 'n Peel, lift the corner of the masked area with a tool or fingernail, and use fingertips to roll the mask toward the area rather than pry from it. In this way, the mask is usually be removed in one piece. However, always check for any small articles which may be left behind. Use in well-ventilated area.

For underglaze designs: Apply base coat of opaque underglaze color to earthenware. Paint design with Mask 'n Peel over base coat. When design is thoroughly dry, apply contrasting color over the ware. While color is still slightly damp, lift corner of masked area and peel off. Simple design work can be done with just the application of Mask 'n Peel. More colorful designs can be achieved with additional layers of Mask 'n Peel and color (except translucent underglazes) as long as the mask is removed after each color application.



Removing the mask.

For glaze designs: Paint a design with Mask 'n Peel directly on witness cone 04 bisque or over 3 coats of dry, unfired glaze applied to witness cone 4 bisque. When mask is dry, apply 1 coat of a second glaze color, then move mask while glaze is still slightly damp. As with underglazes, excessive applications of Mask 'n Peel and 1 coat of glaze can be used.

For nonfired color designs: Apply directly to bisque for protection of eas while applying adjoining colors. Apply over a base coat color. When mask is dry, apply the adjoining or second color, then

remove mask while color is still slightly damp. Repeat as desired.

Brush and product care: Clean brush in Hand and Brush Cleaner and rinse in warm water immediately after use. (If Mask% Peel should accidentally dry in the brush before it can be cleaned, soak in Antiquing Solvent or mineral spirits to loosen residue, then wash in warm, soapy water to complete cleaning.) Wipe rim of jar and inside of lid, then close tightly.

How To Use Red Glazes

Beautiful results with red glazes are easy to achieve when you follow these simple "rules for reds!"



Rules for red glazes

1. Always apply red glazes to cone 04 bisque.
2. Damp-sponge bisqueware to remove dust before you begin glazing.
3. Use a thoroughly clean glaze brush. Some ceramists keep a special brush just for red glazes; however, this is not necessary if you know your brush is clean.
4. For the average red glaze, four good, flowing coats are necessary.
5. Always work in a clean area. If you're working in a classroom, make sure there's enough space so no one can splash a contaminating color onto your ware.
6. Watch for SALT in any form — popcorn, crackers and other snacks. Salt causes red glazes to fade and/or leave white patches. It is the number-one enemy of red glazes.
7. When applying a red glaze, hold the ware with a paper towel to protect hands. Paper towels help eliminate dust spots.
8. Red glazes will normally be light

or white in appearance around sharp or detailed edges. This problem can be prevented if you put a little extra glaze on the sharp edge.

9. If you apply a red glaze to the outside of a piece, it's best to apply the red to the inside as well. Be aware, however, that red glazes have a tendency to craze.
10. If possible, fire in a kiln loaded only with red- or clear-glazed items, and vent properly.* Never fire red-glazed pieces with GREENWARE or with items glazed with green or yellow glazes.
11. For best results, fire to witness cone 06. Always use witness cones on the shelf. Do not place red-glazed ware too close to the kiln elements; keep them 1" to 2" away.
12. Fire in the normal manner. Do not let red-glazed pieces soak for an extra time on the lower cycle of the firing and do not fast-fire.



The woman in the photo is breaking at least five important rules for reds. Count them for yourself!

Important tips

1. Gold and other overglazes can be used with great success over fired red glazes.
2. Although red glazes flow somewhat during the firing, they can be used with majolica techniques. These are most successful with strong, dark E-Z Stroke colors applied over unfired red glaze on horizontal surfaces. Make a test-sample before making a large item.

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Problem solving

1. **Washed out or greyed reds**
Causes: fired too hot; not enough color applied; fired with green-glazed items or greenware.
2. **Washed out or grey on one side of piece** Cause: fired too close to an element or another piece.
3. **Blisters** Causes: overfiring; thin application; poorly vented kiln.
4. **Black specks in glazed finish**
Causes: dirty brush; lead or graphite contamination. (But be aware that there will always be a few dark specks in red glazes due to the raw materials used in the products.)
5. **Crazed glaze** Cause: glaze applied to immature bisque.
6. **Long streaks of dark color** Causes: dirty brush; ferrule of brush scraped against the ware.

How to Use the Duncan Color Chart

Now that you've read about

Duncan glazes, treat yourself to, seeing them in all their beauty after firing. Visit your local Duncan Dealer or nearest Duncan Distributor, where you'll find the Duncan Tile Color Chart on display. This chart presents all the Duncan colors — underglazes, glazes and nonfired products — on individual tiles.

Each color family is designated by name and is shown in color-wheel sequence, giving you the easiest possible comparison of close tones.

The tiles present each color, fired or finished, in accurate, true-to-life color.

Tiles incised with the Duncan pot and bowl logo are used for transparent or semitransparent glazes. Plain tiles are used for opaque and semiopaque glazes.

Dinnerware-safe glazes are indicated by a star on the tiles.

Each color is identified by name and number just below each individual tile.

You'll find the **Duncan Tile Color Chart** helpful in a number of ways:

- ✓ Checking the exact color and surface texture of each product after firing or finishing.
- ✓ Determining whether a glaze might be used over underglazes by looking for the Duncan pot and bowl on the tile that indicates that the glaze is a clear or a colored transparent.
- ✓ Checking for the star on the tile that indicates dinnerware safety when selecting a glaze.
- ✓ Seeing the easiest possible comparison of close tones within each color family.
- ✓ Matching colors in different fired and nonfired color families for color-coordinated home decor.
- ✓ Finding ceramic colors that mix and match with items you already have in your home.
- ✓ Planning your own custom ceramics projects.

Overglazes

Overglazes are ceramic products

Designed for application over a fired glaze. There are three basic types of overglazes: **metallics, lusters and china** paints.

Metallics

These are real precious metals applied to fired glazed ware as the final finish.

Lusters

These are metallic compounds which are applied as a final finish on fired glazed ware and become iridescent after firing.

China paints

These are mineral colors applied in design or as detailing over fired glazed ware.

Characteristics

Metallics are opaque overglazes with the brilliance of 22-karat yellow gold or white gold. Their appearance is determined by the glaze the

metallic is applied over (on a gloss glaze, the metallic will be shiny; on a matte glaze, the metallic will be dull). Metallic overglazes are normally applied over a fired glaze but can also be applied to high-fired porcelain bisque.



Bright Gold Overglaze is the perfect final touch!

Lusters are translucent overglazes with a lustrous iridescence. Their appearance is determined by the glaze that the luster is applied over (gloss glaze, shiny luster; matte glaze, dull luster).

For ease of application, -each

brush-on overglaze is tinted with its own special color. Bright Gold has a red tint; White Gold has a green tint; Mother-of-Pearl has a blue tint.

Application

Success with overglazes depends on correct preparation of the ware to which they will be applied. Greenware should be fired to at least witness cone 04. Note these exceptions: Ware to be decorated with **Red-Strokes** should be bisque fired to witness cone 03. If a **Crackleton Glaze** is to be used, bisque fire to witness cone 06. Glaze and fire ware to witness cone 06. Clean surface of the ware by buffing with soft cloth or by wiping it with a lint-free cloth moistened with isopropyl (rubbing) alcohol to remove hand grease and dirt. (Be sure ware is dry before applying overglazes.) After ware has been cleaned, avoid excessive handling.

When using Duncan Overglazes, work in a clean, dust-free area with

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Overglazes

good ventilation. Your hands must be free of all oils, hand lotion and moisture.

Choose any Duncan brush with soft hair that will produce the coverage or strokes you wish to achieve. **BR 594 No. 12 Mother-of-Pearl** is perfect for applying luster. Brushes used to apply Duncan Overglazes should be cleaned with Duncan Essence and wiped on a paper towel. Brushes must be thoroughly dry before use. Reserve brushes for exclusive use with only one Duncan Overglaze.

Metallic Overglaze Application

1. Do not stir or shake overglaze.
2. Place a small amount of overglaze on a glazed palette; apply 1 smooth coat.
3. Try to attain an even tint:
 - A. Bright Gold tint should be flag red in color.
 - B. White Gold tint should be Christmas green in color.
4. Do not let metallics pool in an area; brush them out smoothly.
5. Clean brush in Essence and let dry.

Luster Overglaze Application

Brush-On Mother-of-Pearl

1. Do not stir or shake overglaze.
2. Place a small amount of overglaze on a glazed palette:
 - A. For a swirled look, swirl on 1 coat, overlapping strokes.
 - B. For a smooth look, brush on all strokes in the same direction.
3. Correct application should produce a light blue tint.
4. Clean brush in Essence and let dry.

Spray-On Mother-of-Pearl

1. Shake can well before each use. Holding can upright, 10"-12" from surface of ware, spray with slow, even motion. Surface should have an overall wet look, but do not spray too heavily as sagging and drips may occur. Apply as many light coats as necessary until light blue color develops on surface.

2. After spraying, turn can upside down and spray until only clear gas appears. Wipe valve clean. If spray stops or is irregular, twist off spray head and clean.

Tips

1. If overglazes are accidentally applied on the wrong area, dip a cotton swab in Essence and wipe off misplaced color.
2. If any areas are missed, go back and touch up before either the metallic or the luster overglaze dries.
3. For solid coverage with Bright Gold, use either a yellow glaze or a yellow underglaze for best results; for solid coverage with White Gold, use a grey glaze or a grey underglaze.

Firing

1. Overglazes dry in about one hour but overglazed ware can be fired while still wet. The kiln must be clean, well ventilated (do not overload) and follow a normal firing schedule. Do not touch wet decoration and handle as little as possible until ware is fired to avoid smudging.
2. Overglazed items should be stilted for firing:
 - A. Fire metallics to witness cone **019**.
 - B. Fire lusters to witness cone **020**.

Note: When using metallics and lusters on the same piece, it is best to apply the *metallic* first, fire to witness cone **079**, and then apply the luster and refire to witness cone **020**.

Dinnerware Safety

Duncan Overglazes can be used on surfaces that come into contact with food and drink. Care must be taken to avoid hard scrubbing when washing overglazed ware, because of the possibility of scraping off the thin layer of metal or luster. Treat your overglazed pieces as you would fine china. Although overglazed ware will take repeated washings in a dishwasher, the overglaze will eventually wear away.

Note: Ware decorated with metallic overglazes should not be used in microwave ovens.

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Caution

Overglazes contain solvents and should be used in a well-ventilated area. Those susceptible to odors (such as pregnant women) should be especially careful to work only in areas with an adequate ventilation system. During firing, odors are not dangerous but can be offensive. These odors quickly leave the area; however, it is not desirable to work in the kiln area during firing unless the kiln has a vented hood and an exhaust fan.

Incompatible Glazes

The following glazes cannot be used with overglazes as their chemical makeup is not compatible or because they produce results that are undesirable. Always check the label of the glaze jar for compatibility.

AN 316 Antique Mint Green
AR 603 Autumn
AR 704 Golden Bronze
AR 707 Pewter
AR 709 Smoky Silver
AR 749 Colonial Pewter
AR 750 Moonlight Blue
20026 Monterey jade
20085 Coffee Clouds
DG 310 Rust
GL 609 Emerald Green
GL 609A Emerald Green
GL 619 Black Luster
GL 640 Foliage Green
GL 645 Bronze
GL 669 Bottle Green
GL 672 Evergreen
SY 553 Antique Brass
SY 554 Antique Bronze

Duncan Overglaze Accessory

OA 901 Essence is the necessary cleaner for brushes used with Duncan Overglazes. Any other cleaning agent may contain water or solvents which will cause separation of the overglaze during subsequent applications.

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Folk art brushwork.

Folk art and country dot designs

Spread the undiluted color shallowly on a glazed tile, dip the Duncan Dot Maker tool, Stylus end or brush handle end in the color, then stamp onto the base-coated ware. Dots of equal size are made by reloading the tool with color for each application. Dots descending in size are made by continuing to stamp the color onto the ware without reloading the tool.

Brushwork

The Bisq-Stain Opaques can be applied over any dry nonfired color. When creating design work and detailing, use suitable brushes to apply 1 coat of undiluted color straight from the jar or place a little color on a glazed tile and thin with water or Thin 'n Shade.

Stenciling

Position stencil on ware and fix in place with transparent tape. Spread small amount of Bisq-Stain Opaque color on tile. Dip Stencil brush in color, pounce on clean area of tile to remove excess, then wipe on paper towel. Apply color through stencil with dabbing or light pouncing stroke to create design. Remove stencil when color is dry, then clean stencil immediately before repositioning it on ware.

Sponging

Spread a small amount of Bisq-Stain Opaque color on a glazed tile, dip a slightly dampened sponge

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Series are decorative...
brush-on the finishes for objects decorated with nonfired products. Some are also used as aids in decorating techniques. Surface characteristics range from matte to very glossy.

As you read about Duncan nonfired products, please refer to the Glossary in the back of this manual for definitions of unfamiliar terms.

Some basic application techniques, such as airbrushing, antiquing, banding, drybrushing, sgraffitoing, spattering, sponging, stenciling, stippling, etc., are illustrated and explained in a later section, as well as defined in the Glossary.

Bisq--Stain@ Opaques

Characteristics

Bisq-Stain Opaques are water-based acrylic colors that can be intermixed to create an almost endless array of color tones, tints and shades. They dry to the touch in a few minutes, eliminating any long waiting period before proceeding with the next step. Because these colors are opaque in most cases, you can easily apply one over another, blocking out the underlying color.

Application

For solid-color coverage on bisque and other craft surfaces, apply 1 or more good, smooth coats of Bisq-Stain Opaque color as needed, using an Opaque brush. Thin with water or Duncan Thin 'n Shade if needed.

Folk art brushwork

(Pennsylvania Dutch, rosemaling, bauernmalerei, French provincial, Russian, Tyrolian figure painting, Zillertal, etc.) Bisq-Stain Opaques are ideal for the various brushstrokes used in folk art decorating techniques. A small amount of color is placed on aluminum foil or a glazed tile for greater control of the amount and placement of color picked up by the brush, and thinned with water or Thin 'n Shade to the consistency specified by the particular technique. For blended brushstrokes, the brush is loaded with one color, then tipped or sideloaded with a second color.

...require firing...
glazes and...
They are also ideal for...
craft surfaces, such as plaster, wood, fabric, canvas, paper, art board, dough art, cork and papier-mache. The finish is permanent in the sense that it will not chip or peel off but, naturally, it cannot be compared to a permanent finish such as that produced by a fired glaze.

Characteristics

Nonfired colors should be used only on decorative objects. Some ceramic utility items, such as canister sets, vases, candy dishes, cigarette boxes, etc., can be decorated with nonfired colors if the area of the witness cone 04 bisque piece which is to come into contact with water or food is first glazed and fired to witness cone 06. Nonfired products work best on ceramic bisque that has been fired to witness cone 04.

There are several types of nonfired products: opaque colors, translucent colors, accessory products and sealers. Each category includes so many versatile products that the fun of decorating with nonfired products and techniques is virtually unlimited.

Opaque colors

These colors are used for solid-color coverage as well as for design work and detailing. Usually, if one color is applied over another, the underlying color will not show through.

Translucent colors

These colors are primarily used as antiquing colors over opaque colors, but they are also excellent for specific translucent color techniques such as puging, china painting effects and shading, as well as for design work and detailing.

Accessory products

These are best defined as products that extend the uses of nonfired colors or act as preparation or cleaning helpers. Nevertheless, some accessory products are exciting decorating stars in their own right.

Nonfired Products

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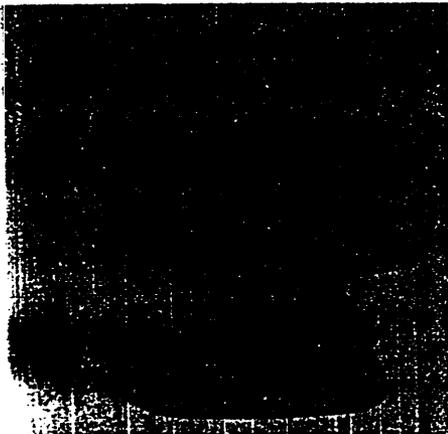
in color, then blot on paper towel to remove excess. Pounce color over any dry nonfired color with quick up-and-down strokes, allowing background to show through here and there. Varying effects can be achieved by using differently textured sponges or crumpled paper towels or tissues.

As an antique

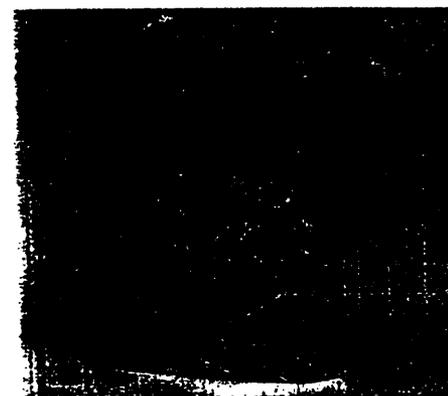
All Bisq-Stain Opaque colors can be used for antiquing by thinning with Thin 'n Shade, preferably a blend of 50% color to 50% Thin 'n Shade. Working with a small area at a time, brush this mixture over dry piece that has been decorated with any of the Duncan nonfired color products, being certain to work into all crevices. Use a soft cloth or facial tissue to wipe back color, following the contours of the piece. If a lighter finish is desired, dampen a clean cloth or tissue with water and continue removing color from raised areas of the piece. If a deep-toned antique effect is desired, repeat the antiquing steps.

Antiquing Bisq-Stain Opaques

When dry, Bisq-Stain Opaque colors can be antiqued with any



before antiquing.



after antiquing with 'a translucent.

nonfired translucent, or with a nonfired water-based color that has been mixed with an equal amount of Thin 'n Shade. Follow antiquing procedure described above.

Airbrushing

Thin the Bisq-Stain Opaque color with Thin 'n Shade to the consistency of milk (usually 60% thinner to 40% color).

Sealing

Give decorated items a hard, protective finish by applying a Ceramic Spray or Brush-On Sealer over the dry piece.

Brush and product care

Clean brushes with water immediately after use. Give brushes an occasional deep cleaning in Duncan t-land and Brush Cleaner. Wipe rims of jar and insides of lids, then close tightly.

Liquid Pearls

Characteristics

Liquid Pearls are water-based acrylic colors with a soft, pearlescent finish. Some Liquid Pearl colors contain particles that give them a golden glow. Liquid Pearls are self-sealing.

Application

For solid-color coverage on bisque and other craft surfaces, apply 2 or more smooth coats as needed, using a soft brush. Thin with water or Thin 'n Shade if needed.

Brushwork

To control the amount and location of color picked up by the brush, use water to dampen the brush to be used and blot off excess before loading brush with Liquid Pearl color. Apply over another Liquid Pearl or over a nonpearlized acrylic base coat for a contrast of finishes.

Stenciling

Position stencil on ware and fix in place with transparent tape. Spread small amount of Liquid Pearl color on tile. Dip Stencil brush in color, pounce on clean area of tile to remove excess, then wipe on paper

towel. Apply color through stencil with dabbing or light pouncing stroke to create design. Remove stencil when color is dry, then clean stencil immediately before repositioning it on ware.

Sponging

Spread a small amount of Liquid Pearl color on a glazed tile, dip a slightly dampened sponge in color, then blot on paper towel to remove excess. Pounce color over any dry nonfired color with quick up-and-down strokes, allowing background to show through here and there. Varying effects can be achieved by using differently textured sponges or crumpled paper towels or tissues.

As an antique

Liquid Pearl colors can be used for antiquing dry nonfired colors, including other Liquid Pearls, by thinning with Thin 'n Shade, preferably a blend of 50% color to 50% Thin 'n Shade. Brush this mixture over a dry piece that has been decorated with any of the nonfired color products, being certain to work it into all crevices. Use a soft cloth or facial tissue to wipe back color, following the contours of the piece. If a lighter finish is desired, dampen a clean cloth or tissue with water and continue removing color from raised areas of the piece.

Antiquing Liquid Pearls

When dry, Liquid Pearl colors can be antiqued with any nonfired translucent, or with a nonfired water-based color that has been mixed with an equal amount of Thin 'n Shade. Follow antiquing procedure described above.

Airbrushing

Thin the Liquid Pearl color with Thin 'n Shade to the consistency of milk (usually 60% thinner to 40% color).

Sealing

Since Liquid Pearls are self-sealing, there is no need to reseal them. If desired, however, they can be finished with a Ceramic Spray or Brush-On Sealer.

Tip: When a piece is partly painted with Liquid Pearls and partly with

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er nonfired colors, the entire piece be finished with Translucent Pearl Ceramic Spray Sealer for a beautiful, only pearlescent finish.

Brush and product care

Clean brushes with water immediately after use. Give brushes occasional deep cleaning in Ceram Hand and Brush Cleaner. Wipe rims of jars and insides of lids, then close tightly.

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Natural Touch® Drybrushing Acrylics

Characteristics

The Natural Touch colors are water-based acrylics especially formulated for all types of drybrushing: realistic effects on animals and birds; Softie fabric looks; and dark-to-light and light-to-dark techniques. They are extremely opaque and have a very smooth consistency for easy application. They dry to a matte finish.



Natural Touch colors are ideal for drybrushing!

Preparing ware for drybrushing

Greenware for drybrushing must be carefully cleaned. Use a cleanup tool to recarve any detail that sponging may have softened. Check for flaws such as pinhole and 'bumps' that will be exaggerated when drybrushed and smooth away.

Brush-on application

For solid-color base coats on bisque and other craft surfaces, apply

1, or more coats as needed. It is very important that your base-coat be as smooth as possible. Use an Opaque brush with very little color on it. Too much color at a time can leave ridges on the ware that will show up when it is drybrushed. Scrub the base coat into the bisque to ensure a smooth application.



Natural Touch Drybrushing Acrylics on a CeramiCitter.

Spray-on base-coat application

For Natural Touch Spray Base Coats, shake can well before each use. Holding can upright, 10"-12" from surface of ware, spray with slow, even motion. Surface should have an overall wet look, but do not spray too heavily as sagging and drips may occur. Apply as many light coats as necessary until light blue color develops on surface.

After spraying, turn can upside down and spray until only clear gas appears. Wipe valve clean. If spray stops or is irregular, twist off spray head and clean.

Drybrushing

The general term used for applying accent colors by "dusting" the piece with a brush that has had most of the color brushed out of it. Dip an Opaque brush tip into Natural Touch color, and brush the color back and forth over a flat brown paper grocery bag, a paper towel or a coffee filter until almost no color shows up on the paper. Now, "dust" the brush against the grain on detailed bisque that has been base coated and, if

desired, antiqued. Ordinarily, do not wash the brush before changing to another color. Simply wipe the color out of the bristles with a paper towel. When applying contrasting colors like black and white, or very different colors like red and green, use a second dry brush.

Basic drybrushing

A base coat of 1 or more coats of a Natural Touch color is applied to the ware. For pastel or medium-toned effects: use a light color such as grey or tan, or pastel tones. For dark effects: use a dark brown or black base coat. Antiquing with a Natural Tint Translucent color is optional. A contrasting Natural Touch color is then drybrushed over the base coat or antiqued finish in the following manner. Dip a Flat Opaque brush in the color and brush color back and forth over a flat brown paper grocery bag, a paper towel or a coffee filter to remove excess. Drybrush the color remaining in the brush over the raised detailing on the piece — usually against the grain — until the drybrushed color makes the detailed scene or design visible against the background color. Allow to dry thoroughly. Finish with Porcelain or Super Matte Ceramic Spray Sealer.

Softie fabric looks

Apply 1 coat of a suitable Natural Touch base color completely over a Softie figurine. More than one base color can be used on different areas of the piece. Antique with a Natural Tint Translucent color, if desired. Wipe back and allow to dry. Place a small amount of a lighter toning or contrasting Natural Touch color on a glazed tile. Dip an Opaque brush in color and brush onto a flat brown paper grocery bag, a paper towel or a coffee filter to remove excess. Drybrush highlights here and there over the Softie figurine, emphasizing the folds, tucks and fabric seams, until the desired effect is achieved. Create fabric-look detailing with dots (use your Dot Maker tool, the ends of your Stylus or the end of a brush handle), sprigs (use short brushstrokes), and/or plaid, check and gingham patterns (use brushes). Paint eyes, facial features and other detailing with appropriate Natural Touch colors. Allow to dry thoroughly. Finish with Porcelain or Super Matte Ceramic Spray Sealer.

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Nonfired Products

Dark-to-light drybrushing

Particularly effective for decorating realistic animal and bird figurines, Nativity sets, etc. Apply 1 coat of a dark Natural Touch color completely over the piece. Drybrush suitable Natural Touch colors over appropriate areas, gradually building up layers of color and applying colors in dark-to-light sequence. Add detailing to eyes. Allow to dry thoroughly. Finish with Porcelain or Super Matte Ceramic Spray Sealer.

Light-to-dark drybrushing

Just the reverse of the previous technique, light-to-dark drybrushing begins with a pale base coat, and the drybrushing is applied in light-to-dark order. This technique is often used on Austrian figurines and other detailed items such as clocks and boxes. Usually, light-to-dark drybrushing is completed by antiquing with a nonfired translucent. Allow to dry thoroughly. Finish with Porcelain or Super Matte Ceramic Spray Sealer.

Stenciling

Apply Natural Touch base coat to ware. Allow to dry. Dip stencil brush in a contrasting Natural Touch color, pounce on a clean tile with a quick up-and-down motion to remove excess, then wipe brush on a paper towel. Apply 1-2 coats of the Natural Touch color through the stencil with straight brushstrokes from edges of stencil opening toward center or with jabbing (pounce) strokes.

Sealing

Items drybrushed with Natural Touch colors appear most lifelike when finished with Porcelain or Super Matte Ceramic Spray Sealer; however, the other Ceramic Spray and Brush-On Sealers can be used if desired.

Brush and product care

Clean brushes with water immediately after use. Give brushes an occasional deep cleaning in Duncan Hand and Brush Cleaner. Wipe rims of jars and insides of lids, then close tightly.

Ultra Metallics™

Characteristics

The Ultra Metallics are water-based metallic colors. Their lustrous gleam is always bright, they won't tarnish, and their colors have the depth and realism of actual metals. They can be mixed with any water-based nonfired color to create additional metallic colors. The Ultra Metallics are self-sealing.

Application

Shake jar and stir well. For solid-color cover-age on bisque and other craft surfaces, apply 2 or more coats as needed, using a soft brush. Thin with water or Thin 'n Shade if needed.

Brushwork

The Ultra Metallics can be applied over any dry nonfired color. When using an Ultra Metallic color over a base color to create designs, detailing, trims or accents, apply 1 coat with a soft brush. When designing directly on bisque with two or more Ultra Metallic colors, apply 2 or more coats as for solid-color coverage.

Stenciling

Position stencil on ware and fix in place with transparent tape. Spread small amount of Ultra Metallic color on tile. Dip Stencil brush in color, pounce on clean area of tile to remove excess, then wipe on paper towel. Apply color through stencil with dabbing or light pouncing stroke to create design. Remove stencil when color is dry, then clean stencil immediately before repositioning it on ware.

Sponging

Spread a small amount of Ultra Metallic color on a glazed tile, dip a slightly dampened sponge in color, then blot on paper towel to remove excess. Pounce color over any dry nonfired color with quick up-and-down strokes, allowing background to show through here and there. Varying effects can be achieved by using differently textured sponges or crumpled paper towels or tissues.

As an antique

Ultra Metallic colors can be used

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for antiquing dry nonfired colors, including other Ultra Metallics, by thinning with Thin 'n Shade, preferably a blend of 50% color to 50% Thin 'n Shade Brush this mixture over a dry piece that has been decorated with any of the nonfired color products, being certain to work it into all crevices. Use a soft cloth or facial tissue to wipe back color, following the contours of the piece. If a lighter finish is desired, dampen a clean cloth or tissue with water and continue removing color from raised areas of the piece.

Antiquing Ultra Metallics

When dry, Ultra Metallic colors can be antiqued with any nonfired translucent, or with a nonfired water-based color that has been mixed with an equal amount of Thin 'n Shade. Follow antiquing procedure described above.

Airbrushing

Thin the Ultra Metallic color with Thin 'n Shade to the consistency of milk (usually 60% thinner to 40% color).

Sealing

While Ultra Metallics are self-sealing, their metallic sparkle can be enhanced by spraying the dry decorated piece with Super Gloss or Clear Gloss Ceramic Spray Sealer.

Brush and product care

Clean brushes with water immediately after use. Give brushes an occasional deep cleaning in Duncan Hand and Brush Cleaner. Wipe rims of jars and insides of lids, then close tightly.

Oil-Based Transluents

Characteristics

The Oil-Based Transluents are available in both colors and wood tones, and are used primarily for antiquing. Their rich formulation extends their uses to rouging, china painting effects and design work.

Application

The versatile Oil-Based Transluents can be used over all dry Duncan

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products. When used over water-based colors, it is not necessary to seal the surface before applying an Oil-Based Translucent. When used over other Oil-Based Translucent colors, it is necessary to seal the surface with a Ceramic Spray or Brush-On Sealer before applying an Oil-Based Translucent.

As an antique

Shake jar and stir well before using. Use a soft brush to apply 1 coat of an Oil-Based Translucent over the dry decorated item, being certain to work it into all crevices. If the piece is very large, work with one section at a time. Use a soft cloth or facial tissue to wipe back color, following the contours of the piece. As cloth or tissue becomes saturated with color, change to a clean area of the cloth or use a clean tissue, and continue wiping back until desired effect is obtained. If the translucent dries before wiping back is completed or if you have to leave your project for a time, lightly dampen a clean piece of cloth or tissue with Antiquing Solvent and continue to wipe back until desired finish is obtained.

Rouging

This method calls for the application of color with a cloth over a dry nonfired color base coat. Rouging Oil-Based Translucent color onto a piece decorated with nonfired colors can be done before or after antiquing. The most important thing to remember is that you are going to rouge in a little color at a time and that you must apply a sealer (fixative) after every layer of rouged color. We recommend Clear Matte or Porcelain Ceramic Spray Sealers as the rouging fixative. For rouging, use only the color in the lid of the Oil-Based Translucent jar after shaking well. Using small pieces of lint-free material (old, clean flannel works very well), fold material into several layers and form a little pad over index finger. Use a separate pad for each Oil-Based Translucent color. Dip pad into color and blot off all excess onto a paper towel, then rouge on color to desired area by very gently rubbing with a circular motion. Blend all colors smoothly over an area. Do this once. If a deeper color tone is

desired, apply a sealer as a fixative as soon as the area is dry and repeat the rouging steps. Continue to repeat rouging and fixative steps until desired color is obtained.

Brushwork

For design work and detailing, place a small amount of each Oil-Based Translucent color on a separate area of a glazed tile to control the amount and location of color picked up by the brush. Load your brush and proceed with chosen technique. Two or more colors can be blended with one brushstroke for a shaded effect. If you do not desire a blended color effect, you must apply a Ceramic Spray or Brush-On Sealer between each color application.

Blending and shading

Place a small amount of each Oil-Based Translucent on a separate area of a glazed tile to control the amount and location of color picked up by the brush. Moisten a soft brush in Translucent Stain Media (see section on Translucent Stain Media), blot excess on paper towel and tip brush in desired color, working color up into hairs of brush. Apply with tipped side of brush in crevices so that shading is very intense in deepest crevices and blends out to a very subtle color. Use a dry brush or a brush moistened in Translucent Stain Media to blend color further on background areas. Seal with Porcelain Ceramic Spray Sealer.

China painting effects

Work directly on a fired glaze surface or on ceramic bisque. Bisque items should be sealed with Matte Brush-On Sealer, applied either directly on the bisque or over the nonfired color products of your choice. Place a small amount of each Oil-Based Translucent on a separate area of a glazed tile to control the amount and location of color picked up by the brush. Moisten a soft brush in Translucent Stain Media, work it well into the brush hairs, blot excess on a paper towel, load and/or tip brush in the desired color and proceed with your chosen technique. To build up intensity and depth of color, build up thin layers of color as for a firing of china paints, using a light coat of Clear Matte or Porcelain Ceramic Spray Sealer between layers.

Start with the lightest colors and finish with the darker tones. Blend and soften shading by stippling with a dry brush or gently pat with a soft cloth or facial tissue. Dampen a soft cloth, tissue or brush in Translucent Stain Media or Antiquing Solvent to wipe color away from highlights if the area has become tacky. If the color area is still moist, just use a soft cloth, tissue or dry brush to gently wipe away. When the project is complete, seal with Porcelain Ceramic Spray Sealer.

On porcelain bisque

Beautiful china painting effects can be created with the Oil-Based Transluents on porcelain. Seal the porcelain piece with Porcelain Ceramic Spray Sealer before applying the first color. Because porcelain bisque has a very hard, nonporous surface, the Oil-Based Translucent colors must be applied in very thin layers. Thin the color with Translucent Stain Media (50% color, 50% Translucent Stain Media), both to thin the colors and to hasten drying time. Apply with a soft brush. The colors must be allowed to dry between layers, and sealed with a fixative after each layer of color. Porcelain Ceramic Spray Sealer is the recommended fixative for this technique.



Oil-Based Transluents are perfect on porcelain!

Airbrushing

Thin the Oil-Based Translucent color with Antiquing Solvent to the consistency of milk (usually 50% thinner to 50% color).

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Sealing

Give decorated items a hard protective finish by applying a Ceramic Spray or Brush-On Sealer over the dry piece.

Tip: A polished finish with a soft glow can be obtained by omitting the sealing step and polishing the dry piece with a soft cloth.

Brush and product care

Translucent brushes should be cleaned by squeezing excess color onto a paper towel, then cleaning in Antiquing Solvent. Give brushes an occasional deep cleaning in Duncan Hand and Brush Cleaner. Wipe rims of jars and insides of lids, then close tightly.

Tip: If the Oil-Based Translucent becomes too thick, due to evaporation of the oil base, add a few drops of Antiquing Solvent, mix thoroughly, and your Oil-Based Translucent color will return to its original state.

Water-Based Transluents

Characteristics

The Water-Based Transluents are available in both colors and wood tones. Although primarily used for antiquing, they can also be used for coloring and brushwork. The Water-Based Transluents are ideal for use by children because their water-based formulation provides easy cleanup with water and maximum convenience.

Application

These multipurpose translucent colors can be used over all Duncan nonfired products when dry, and it is not necessary to seal the surface before application, even over oil-based colors. The Water-Based Transluents can be thinned with water or used with Thin 'n Shade for a variety of techniques.

As an antique

Shake jar and stir well before using. Thin with water or Thin 'n Shade as needed. Use a soft brush to apply 1 coat of a Water-Based Translucent over the dry decorated item, being

certain to work it into all crevices. If the piece is very large, work with one section at a time. Use a soft cloth or facial tissue to wipe back color, following the contours of the piece. As cloth or tissue becomes saturated with color, change to a clean area of the cloth or use a clean tissue, and continue wiping back until desired effect is obtained. If you wish to remove additional color, lightly dampen a clean piece of cloth or tissue with water or Thin 'n Shade, and continue to wipe back until desired finish is achieved. The lightness or darkness of the final finish will depend upon the amount of Water-Based Translucent removed.

Rouging

Rouging Water-Based Translucent colors can be done before or after antiquing. If antiquing was done, make sure the piece is fully dry before rouging. A sealer is not required between each layer of rouged color, but each layer must be fully dry before applying second layer. For rouging, use only the color in the lid of the Water-Based Translucent jar after shaking well. Using small pieces of lint-free material, such as old, clean flannel, fold material into several layers and form a little pad over index finger. Use a separate pad for each Water-Based Translucent color. Dip pad into color and blot off all excess onto a paper towel, then rouge on color to desired areas by very gently rubbing with a circular motion. Blend all colors smoothly over an area. Do this once. If a deeper color tone is desired, repeat rouging steps as soon as area is dry. Continue to repeat rouging steps until desired color is obtained.

Brushwork

Place a small amount of each Water-Based Translucent you will be using on a separate area of a glazed tile to control the amount and location of color picked up by the brush. Load your brush and proceed with chosen technique. You can blend two or more Water-Based Translucent colors by loading your brush with Thin 'n Shade, blotting off excess onto paper towel, then tipping with selected colors and blending over an area. You can place one Water-Based Translucent color over

another when dry, without lifting off the first color.

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China painting effects

Place Water-Based Translucent colors on separate areas of a glazed tile to control the amount and location of color picked up by the brush. Moisten a soft brush with Thin 'n Shade, work it well into the brush hairs, and blot excess on a paper towel before loading the brush or tipping it with color. Apply a thin layer of color, then slowly add layers of color until the desired intensity of color is achieved.

On porcelain bisque

Fine china painting effects on porcelain can be accomplished with the Water-Based Transluents. Because porcelain bisque has a very hard, nonporous surface, the Water-Based Translucent colors must be applied in very thin layers. Thin the color with Thin 'n Shade (50% color, 50% Thin 'n Shade). Even though Thin 'n Shade retards drying time, it thins the thick Water-Based Translucent color sufficiently to work on porcelain bisque. Apply the thinned color with a soft brush. The colors must be allowed to dry between layers, and sealed with a fixative after each layer of color. Porcelain Ceramic Spray Sealer is the recommended fixative for this technique.

Patina effect

Patina Water-Based Translucent can be used to create an antiqued finish over any dry nonfired color. When used as an antique over metallic colors, Patina creates the same green color film created naturally only by long exposure to the weather.

Airbrushing

Thin the Water-Based Translucent color with Thin 'n Shade to the consistency of milk (usually 50% thinner to 50% color).

Sealing

Give decorated items a hard, protective finish by applying a Ceramic Spray or Brush-On Sealer over the dry piece.

Tip: A polished finish with a soft glow can be obtained by omitting the

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sealing step and polishing the dry piece with a soft cloth.

Brush and product care

Clean brushes with water immediately after use. Give brushes an occasional deep cleaning in Duncan Hand and Brush Cleaner.

Wipe rims of jars and insides of lids, then close tightly.

Tip: If Water-Based Translucent *comes too thick, simply add a few drops of water, mix well, and your Water-Based Translucent color will return to its original state.*

Natural Tint@ Transluents

Characteristics

The Natural Tints are oil-based transluents that can be wiped back with water, making them very easy to use. Some Natural Tint Transluents contain gold powder and produce a soft golden sheen. The Natural Tints have a thick, pasty consistency, which allows a super smooth application. Because these colors do not soak into the underlying color or colors, they give a very clean antiqued effect.

Application

The versatile Natural Tint Transluents can be used over all Duncan nonfired products when dry. When used over nonfired water-based colors, it is not necessary to seal the surface before applying a Natural Tint Translucent. When used over other Natural Tint colors, it is necessary to seal the surface with a Ceramic Spray or Brush-On Sealer before applying a Natural Tint color.

As an antique

Use a soft brush to apply 1 coat of a Natural Tint Translucent color directly over the dry decorated item, being certain to work it into all crevices. Use a soft cloth or facial tissue to wipe back color, leaving an antiqued effect. To remove more color, moisten cloth or tissue with water or Thin 'n Shade and wipe back again. Although Natural Tint Transluents can be wiped back with water, they are oil-based and are never thinned with water.

Brushwork

Use a soft brush to apply undiluted Natural Tint color straight from the jar over a dry nonfired color base coat.

On porcelain bisque

'Beautiful china painting effects can be created with the Natural Tint Transluents on porcelain. Because porcelain bisque has a very hard, nonporous surface, the Natural Tint colors must be applied in very thin layers. Thin the color with Translucent Stain Media (50% color, 50% Translucent Stain Media), both to thin the colors and to hasten drying time. Apply with a soft brush. The colors *must* be allowed to **dry** between layers and sealed with a fixative after each layer of color. Porcelain Ceramic Spray Sealer is the recommended fixative for this technique.



Achieve beautiful soft **matte** effects **on porcelain.**

Sealing

Give decorated items a hard protective finish by applying a Ceramic Spray or Brush-On Sealer over the dry piece.

Brush and product care

Wipe excess color from brushes onto a paper towel, then clean with Antiquing Solvent. Reserve brushes for use only with Natural Tints. Give brushes an occasional deep cleaning in Duncan Hand and Brush Cleaner. **Wipe** rims of jars and insides of lids, then close tightly.

Accessory Products

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AS 951 Antiquing Solvent is used with Oil-Based Transluents as the wiping-back solvent when creating antiqued finishes and as a thinner for airbrushing. It is also the cleaner and conditioner for brushes used with nonfired oil-based products.

Note: Antiquing Solvent is not for use with water-based products.

How to use

For antiqued finishes: To remove additional Oil-Based Translucent color from the piece being antiqued, moisten a soft cloth or facial tissue with Antiquing Solvent, and continue the wiping-back process.

For brushes: To clean brushes, wipe excess translucent on brush onto a paper towel, then work brush in small amount of Antiquing Solvent. Reshape brush and let dry.

Airbrushing: Antiquing Solvent is an excellent medium to thin oil-based translucent colors for airbrushing. Because it slows drying time, the airbrush does not clog or spatter as readily when spraying. Thin the color with Antiquing Solvent to the consistency of milk (usually 50% thinner to 50% color).

AS 952 Hand and Brush Cleaner is a gentle stain remover for hands and an excellent cleaner and conditioner for brushes.

How to use

For Hands: Pour small amount in hands and clean thoroughly. Rinse in warm water, then wash with mild soap.

For Brushes: Remove excess color, then work brush in small amount of cleaner. Rinse in warm water. Reshape brush and let dry.

AS 955 Thickener and Texturizer is an easy-to-use powder that mixes with any nonfired water-based color to create texture or raised designs. When mixed with color, Thickener and Texturizer stays pliable while you are working with it, but it dries to a hard finish without firing.

Basic mixing directions: To prepare Thickener and Texturizer for decorating projects, measure equal parts of the powder and color. Use a

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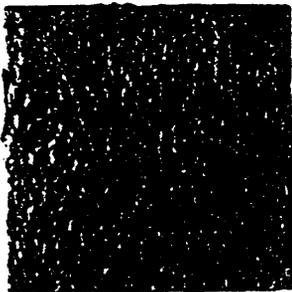
glazed tile or a piece of aluminum foil and a palette knife to mix Thickener Bnd Texturizer for small projects, and a paper cup and a stir tick for larger projects. Add the powder to your color gradually, mixing or stirring thoroughly to eliminate lumps, until the desired consistency is obtained. To thin just lightly, add a few drops of water.



Fixing Thickener and Texturizer with color.

Application: After following basic mixing instructions, Thickener and exturizer can be applied directly to risque and other craft surfaces, over a nonfired water-based base-coat color, or to a decorated piece that has already been antiqued and sprayed. For application, use a sponge, brush, palette knife, cake decorator tool or any other tool that you find suitable. All tools should be cleaned with water immediately after use.

Metal effects: Mix Thickener and exturizer according to basic mixing directions with a nonfired water-based metallic color. Pat mixture onto small items with a sponge or dab mixture



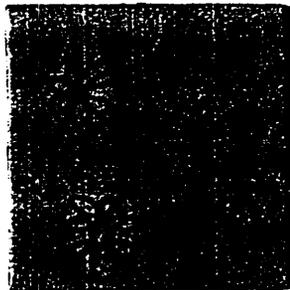
Textured metal effect.



Sculptured pewter effect.

onto larger surfaces with a palette knife to form peaks. When the piece is covered with texture, very lightly smooth down only the tips of the peaks for a corroded appearance. Allow to dry thoroughly.

Raised designs: Mix Thickener and Texturizer -with any nonfired water-based color as directed or to a frosting consistency. (Specially treated paper (vegetable parchment) and decorating tips may be purchased in kitchenware stores and craft shops, or check with your local bakery.) Paper cones are best because they are disposable. Roll paper into 'cone shape, secure with tape, then cut the end of the cone so the cake design tip will fit into it. Drop design tip into cone so that only the design part of the tip shows. Fill the cone with the thick&d color and squeeze cone to force mixture onto object being decorated.. Keep the end of the cake decorating tip in contact with the surface of the object during application to form unbroken design lines. Remember, thick applications dry from the outside in so, even though it feels dry on top, it may be soft underneath. Allow to dry thoroughly. When dry, the surface can be antiqued, painted with other colors, highlighted with metallic colors or left as is and sprayed.



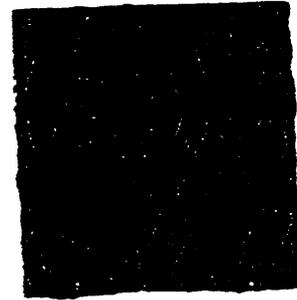
Cake decorator designs,

Hand-formed designs: Mix as directed and use palette knife or brush to form your own designs. Apply a teaspoonful of mixture to a surface and create designs by drawing with a palette knife. Create an unusual rough texture with a stiff-bristled brush.

Wood-grained effects: To create wood-grained effects, mix Thickener and Texturizer with the nonfired water-based acrylic color you want for the base coat. Apply with palette knife first, smooth over the area,, then draw wood-grain lines and knots into

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the surface with tip of knife. Allow to dry. Drybrush with other acrylic colors to accent, and antique with a nonfired translucent.



Wood-grained effect.

Sealing: Give decorated items a hard, protective finish by applying a Ceramic Spray or Brush-On Sealer over the dry piece.

Brush and product care: Clean brushes with water immediately after use. Give brushes an occasion& deep cleaning in Duncan Hand and Brush Cleaner. Close jar tightly.

AS 957 Thin 'n Shade is a water-based medium to be mixed with any Duncan water-based ceramic color, **fired** or **nonfired**. It is an excellent problem-solver in areas where the water system contains contaminants that can affect ceramic color results. Thin 'n Shade prolongs the drying time of colors so they remain workable for a longer period.

Thinning colors: Mix with any water-based ceramic color as you would with water to the consistency required for the specific decorating technique.

AS 958 Translucent Stain Media is an oil-based medium to be used with Oil-Based Translucent and Natural Tint Translucent colors as a binder and shading medium on various surfaces, and with Gold Dust to create a brilliant metallic paint. When used with the Oil-Based Transluents and Natural Tint Transluents, it helps in achieving china painting effects, aids in tinting, blending and shading, and hastens drying time.

Applications

On porcelain bisque: When Translucent Stain Media is used with Oil-Based Translucent colors on porcelain bisque, it helps the translucent adhere to the hard surface and makes possible the soft blending

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around shading of colors usually achieved only with china paints or fired underglaze. Use a mixture of 50% color and 50% Translucent Stain Media.

On fired glaze surfaces: Translucent Stain Media also helps Oil-Based Translucent colors adhere to fired glaze surfaces for china painting effects. Use a mixture of 50% color and 50% Translucent Stain Media.

On ceramic bisque: When using Translucent Stain Media mixtures on ceramic bisque, first seal the surface with 2 coats of Matte Brush-On Sealer, either applied directly on the bisque or over dry items decorated with any of the nonfired color products. This produces a smooth, even surface and makes it easier to shade and blend colors.

Tip: The more Translucent Stain Media used, the faster the object will dry and the glossier will be the finish.

Rouging: Using a small piece of lint-free cloth, fold material into several layers and form a pad over your index finger. Use a separate area of the cloth or a new pad for each color. Dip pad into Translucent Stain Media and blot off excess on paper towel. Next, dip pad into Oil-Based Translucent color and blot off excess onto paper towel, then rouge color onto desired area by gently rubbing with a circular motion. Blend color outward with a cloth dampened with Translucent Stain Media. If a deeper tone is desired, allow to dry, spray with Clear Matte, Porcelain or Super Matte Ceramic Spray Sealer, and repeat the rouging process.

Note: See Oil-Based Translucent and Natural Tint Translucent sections for more information on Translucent Stain Media.

Sealing: Translucent Stain Media gives your decorated objects a lasting finish and does not require a fixative. However, if you prefer, you can use a Ceramic Spray or Brush-On Sealer for different sheens and techniques, and for added permanence.

Brush and product care: Translucent brushes should be cleaned by squeezing excess color into a paper towel, then cleaning in Antiquing Solvent. Give brushes an occasional deep cleaning in Duncan Hand and Brush Cleaner. Wipe rim of

jar and inside of lid, then close tightly.

AS 960 Prep-Coat is a water-based primer for ceramic bisque, plaster and other craft surfaces. It evens out the surface, covering both soft and hard spots, for smoother application and better adherence of colors. Can be used under any water-based nonfired color. Also excellent as a base coat for wood-grained effects achieved with Oil-Based Transluents. A Prep-Coat base sprayed with Porcelain Ceramic Spray Sealer produces the look of porcelain bisque. An excellent base for chalks, Prep-Coat can be tinted with water-based acrylic colors to provide colored backgrounds for chalk work.

Application: Apply 1 even coat of Prep-Coat with a soft brush to ceramic bisque or plaster surface.

Brush and product care: Clean brushes with water immediately after use. Wipe rim of jar and inside of lid, then close tightly.

AS 967 Gold Dust and AS 963 Silver Dust are fine powders that can be mixed with nonfired acrylic and translucent color products to create colors with a metallic sheen. The Dusts are highly concentrated, so a little powder goes a long way. In addition, Gold Dust can be mixed with Translucent Stain Media or a Brush-On Sealer to produce a brilliant gold paint, and Silver Dust with Gloss or Hi-Gloss Brush-On Sealer for a silver paint.

Mixing directions: Generally, mixing proportions are 50% Cold of Silver Dust to 50% nonfired acrylic or translucent color. By varying proportions, you can achieve different metallic effects. Experiment to see which effect you like best. When you need only a small amount, place a little powder on a piece of aluminum foil, add an equal amount of color and mix thoroughly with a stir stick. For larger projects, pour a measured amount of color into a plastic cup, then gradually add an equal amount of Gold or Silver Dust, mixing and stirring thoroughly to eliminate lumps. Stir from time to time during use.

Tip: Use a palette knife to rake a little Dust out of the jar. Use Cold and Silver Dust carefully as they are fine powders and can blow around if

you have a fan on or if the air is otherwise disturbed.

Applications ⁹⁵⁰⁹⁰⁷ CwE 7271

For acrylic or translucent colors with metallic glints: Mix Gold or Silver Dust with nonfired acrylic or translucent colors as directed above. Apply mixtures to bisque and other craft surfaces or over an acrylic base coat according to the directions for the color used in the mixture.

Cold paint: Create a very brilliant gold paint by mixing one part Gold Dust with one part Translucent Stain Media or a Brush-On Sealer. When mixing with a Brush-On Sealer, the choice of sealer depends on the finished effect you want. That is, use Matte Brush-On Sealer to create a gold paint with a matte look, Gloss for a shinier effect, and Hi-Gloss for an extra glossy paint. Use a soft brush to apply 1 good coat of your gold paint to bisque for solid coverage, or over a water-based acrylic base coat for trims, detailing and design work.



Gold Dust mixed with Hi-Gloss Brush-On Sealer produces a brilliant gold paint.

Silver paint: Create a silver paint by mixing one part Silver Dust with one part Gloss or Hi-Gloss Brush-On Sealer. Use a soft brush to apply 1 good coat of your silver paint to bisque for solid coverage, or over a water-based acrylic base coat for trims, detailing and design work.

For a metallic sheen over nonfired color surfaces: Rouge on one of the Dusts straight from the jar with a fingertip pad of soft cloth.

For gold effects over glaze: Mix gold paint, then create brushwork designs over any glazed item used only for decorative purposes. The

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Nonfired Products

old paint can be applied over any glazed surface, new or old. Prepare 3 glazed surfaces by first washing with warm, soapy water and rinsing thoroughly. Make sure no soap film remains by wiping with a paper towel moistened with rubbing (isopropyl) alcohol. Allow to dry before decorating.

Sealing: Give decorated items a hard, protective finish by applying a Ceramic Spray or Brush-On Sealer over the dry piece.

Brush and product care: Clean brushes immediately after use. If you used Translucent Stain Media or oil-based translucent colors, clean brushes by first wiping off any excess on a paper towel, then clean with Antiquing Solvent. If you used a Brush-On Sealer or water-based acrylic colors, wipe on paper towel, then clean with water. Give brushes an occasional deep cleaning in Uncan Hand and Brush Cleaner. Close jars tightly.

AS 962 Diamond Dust consists of small granules of glass-like material. When sprinkled over a wet Brush-On Sealer, Diamond Dust adheres to the surface of items decorated with nonfired products and to fired glaze surfaces.

Application: Use a soft brush to apply a good coat of any Brush-On Sealer or Ceramic Accents Adhesive to desired areas on ceramic bisque and other craft items finished with nonfired products or on fired glaze surfaces. While the sealer is still wet, hold the piece over a clean paper towel and sprinkle with Diamond Dust. Let dry, then shake off any excess Diamond Dust and return it to the container. The choice of sealer (matte or glossy) depends on the background surface of your piece; that is, use Matte Brush-On Sealer on matte-finished surfaces, Gloss on gloss surfaces, and Hi-Gloss on extra glossy surfaces.

Design work: To create design work such as scrolls, borders, lattice work, polka dots, etc., simply apply the Brush-On Sealer in the desired pattern, then sprinkle with Diamond Dust. For intricate designs or designs that cover a large surface, you may find it best to work with one area at a time, since the sealer must be wet to catch and hold the Diamond Dust.

Frosty, snowy looks: Diamond Dust makes it easy to achieve the frosty, snowy look of Christmas. Use it on tree ornaments, Santas, sleighs, reindeer, rooftops, trees and music boxes.

Deep snow effects: For heavy snow, simply repeat applications of the Brush-On Sealer and Diamond Dust until you have achieved the desired depth.

Diamond Dust "Class" Technique: You can make ware with cutout windows look even more magical with Diamond Dust windowpanes. Place strips of masking tape behind all cutout areas on inside of ware. Using a plastic cup, mix Diamond Dust with Hi-Gloss Brush-On Sealer to the consistency best suited for your ware. A mixture of equal parts gives a thin, pasty consistency that works well for small openings and on ware that can be laid down horizontally. For larger openings and on ware that must be placed upright, a thicker mixture is best: two or even three parts Diamond Dust to one part Hi-Gloss Brush-On Sealer. Use a Flat Opaque brush to puddle the mixture onto each cutout area until flush with the outer edges. Allow to dry for 24 hours before removing tape. Try this technique for Christmas cottages and music boxes, decorative gingerbread houses, Halloween haunted houses, night-lights and more!



Diamond Dust "glass" technique.

On fired glaze: Any already glazed decorative item, such as wall plaques, figurines and picture frames, can have sparkling Diamond Dust accents,

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 trims and design work. Apply a Brush-On Sealer just as for nonfired color projects, then sprinkle on Diamond Dust. Try Diamond Dust on such finished fired glaze projects as a snowy Christmas scene in underglazes finished with Ultraclear Gloss; an underglaze floral design finished with a tinted Gloss; or on the lid of a glazed heart box.

Sealing: It is not necessary to seal Diamond Dust as it is applied over finished surfaces, but it can be finished with a Ceramic Spray or Brush-On Sealer if desired.

Brush and product care: Clean brushes with water immediately after use. Close jar tightly.

AS 964 No-Fire Snow produces the texture and appearance of snow without firing. It creates realistic snow effects over finished items decorated with nonfired products and on fired glaze surfaces. It can be tinted with Bisq-Stain Opaque colors for different effects.



No-Fire Snow works on both nonfired products and fired glaze surfaces.

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Nonfired Products

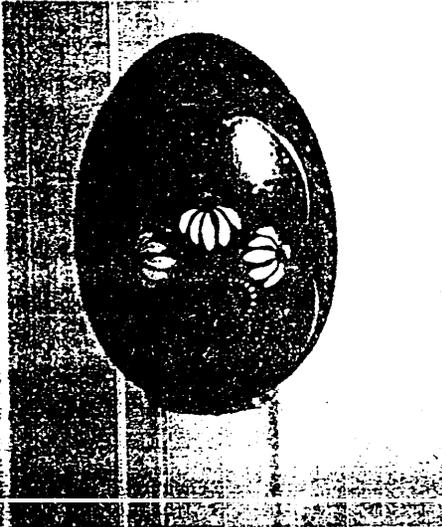
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Application: Stir before use. Use brush or palette knife to apply 1 or more smooth coats of No-Fire Snow as needed for desired effect, allowing to dry between coats.

Sealing: It is not necessary to seal No-Fire Snow as it is self-sealing and can be applied over fired surfaces. However, No-Fire Snow can be finished with a Ceramic Spray or Brush-On Sealer if desired.

Brush and product care: Clean brushes with water immediately after use. Wipe rim of jar and inside of lid, then close tightly.

AS 965 Thickener and Extender can be mixed with nonfired water-based acrylic colors to simulate the textured appearance of oil paints and to prolong the drying time of colors so they remain workable for a longer period. Thickener and Extender color mixtures are excellent for reproducing the look of folk art brushstrokes, palette knife painting and oil-paint effects. Dries to a hard finish.



Thickener and Extender mixed with No-Stain Opaque colors for thickened brushstrokes.

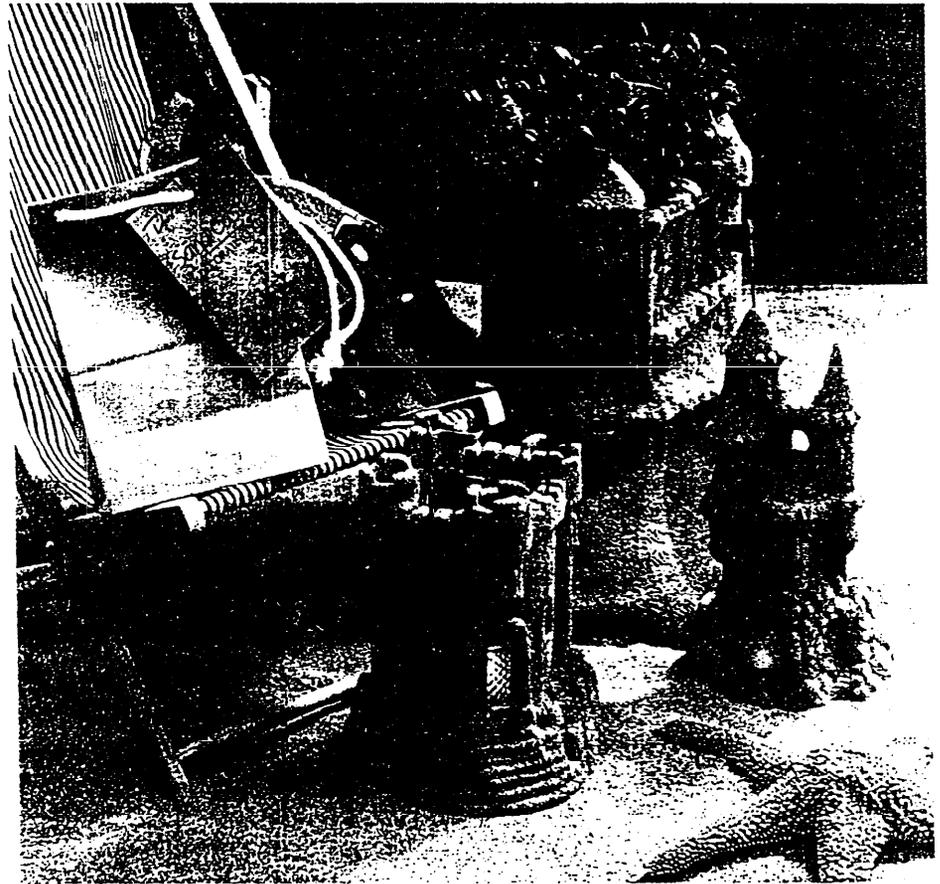
Mixing directions: General mixing proportions are 50% Thickener and Extender to 50% water-based acrylic color. Keep adding color to the Thickener and Extender until the mixture takes on the color of the color.

Application: Apply over water-based acrylic base coat on bisque or other craft surfaces with brush or palette knife. When raised effects are

desired, overapply color mixture as Thickener and Extender mixtures flatten slightly as they dry.

Sealing: Give decorated items a hard protective finish by applying a Ceramic Spray or Brush-On Sealer over the dry piece.

Brush and product care: Clean brushes with water immediately after use. Give brushes an occasional deep cleaning in Duncan Hand and Brush Cleaner. Wipe rim of jar and inside of lid, then close tightly..



Create fanciful sand castles the easy way with Duncan accessory products.

AS 970 Sand Adhesive is both a sealing agent and an adhesive in the Sand Castles Decorating Kit.

Application: Use a soft brush to apply a thin coat of Sand Adhesive to the ceramic bisque castle or desired piece to seal the surface. Let dry. Working over a paper towel, apply Another coat of Sand Adhesive to the piece, then sprinkle Sand Castles sand over the wet adhesive areas. Shake off excess sand and continue to apply adhesive and Sand Castles sand to the

bisque, such as Diamond Dust, glitter, fabric, ribbon, silk flowers and feathers.

Application: Stir well before using. Use a soft brush to apply 1 smooth coat of Ceramic Accents Adhesive over the nonfired acrylic colors wherever placement of the decorative accent is desired. While the adhesive is still wet, sprinkle on accent material and lightly shake off loose excess, or place accent piece on adhesive and press gently piece to secure. Let dry.

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Nonfired Products

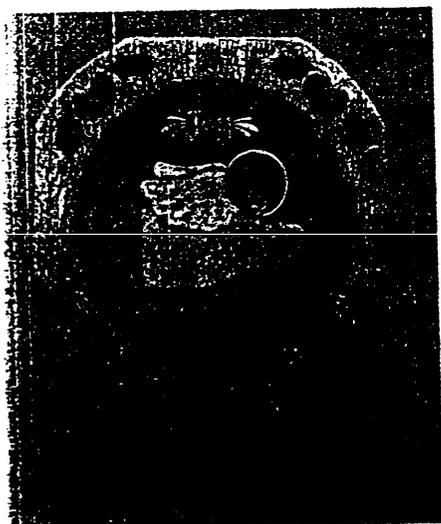
Brush and product care: Clean brushes with water immediately after use. Close jar tightly.

AS 972 Quik-Crackle is a water-soluble medium used to create an antique wood or aged pottery look. Quik-Crackle is used between two nonfired water-based colors (such as Bisq-Stain Opaque or Natural Touch).



Quik-Crackle is easy to use, fun to watch and produces exciting results!

When thoroughly dry, a Quik-Crackle project can be antiqued with an XI-Based Translucent. Brushstrokes and design work can be applied over the dry Quik-Crackle project. When dry, the completed project should be sealed.



Application: To properly fired witness cone 04 bisque, apply a base coat of 1 or more coats of any

appropriate nonfired color. (Note: The following color families work as base coats: Bisq-Stain Opaques; Natural Touch Acrylics; Ultra Metallics; and Liquid Pearls)

With a Flat Opaque brush, apply a smooth, even coat of Quik-Crackle over dry base coat. Clean brush immediately with water and Duncan Hand and Brush Cleaner, making sure no Quik-Crackle is left in metal ferrule. Let Quik-Crackle set for 20 minutes to one hour. Quik-Crackle can set overnight and the same exciting results will be achieved.



Working quickly, use a clean soft brush to apply an even coat of a contrasting topcoat color over the set Quik-Crackle. Once the top-coat color has been applied, do not reapply more color after cracking starts. Cracking follows the direction in which the topcoat color was applied; that is, if color was swirled on, the cracks "swirl." Straight strokes will give your project straight cracks. (Note: The following color families work best for the cracking coat: Bisq-Stain Opaques and Natural

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Touch Acrylics.) Cracking time may vary from color to color. Wait a few minutes for cracking to start.

Note: Liquid Pearls and Ultra Metallics will not work as a top-coat color for Quik-Crackle. These two color families have a tendency not to crack. (Do not use Natural Touch SPRAY Base Coats for top coats.)

For creative variations in crackle surfaces:

Large, bold cracks are achieved by applying a heavier top-coat color. (Note: This will take longer to dry.) Fine cracks are achieved by applying a thin top-coat color. Fine web cracking will be achieved if the top-coat color is sponged on.

Seal finished dry crackled surfaces with any Duncan Ceramic Spray or Brush-On Sealer.

Tips:

1. Flat Opaque brushes give best results when applying Quik-Crackle.
2. Do not rush the project; be sure all phases are properly set or dry before proceeding to the next step.
3. Quik-Crackle will also work on porous craft surfaces, such as wood, plaster of paris and papier-mâché.

Brush and product care: Do not let Quik-Crackle dry in the brush. Clean brush immediately with water and Duncan Hand and Brush Cleaner, making sure no Quik-Crackle is left in metal ferrule.

Brush-On Sealers

Characteristics

Brush-On Sealers are final brush-on coatings that produce smooth, hard surfaces. They are used to brighten the colors and protect the finishes of objects decorated with nonfired color products, and with Gold and Silver Dust to create metallic paints. The Brush-On Sealers dry quickly and evenly to an invisible finish.

Application

Stir well before using. Brush on 2 coats with a soft brush. Thin with water if necessary. Clean brush with water.

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Possible Problems by Color Family

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Problems	Causes	Solutions
GL 628 Hawaiian Blue		
Tendency to craze.,	A characteristic of the product's composition.	No remedy.
Dip 'n Done Glazes		
Bare spots.	Dipped improperly.	Reapply with a brush and refire.
Bubbles, yellowing or discoloration in crevices.	Glaze was too thick or dipping was too slow.	Thin remaining glaze with water.
Crawling and pulling.	Glaze too thick and/or overapplied.	Thin glaze with water-or dip more quickly.
Small bare spots.	Dipping tongs left bare spot.	Use fingertips to touch up with glaze before firing.
Glaze on dipped ware does not dry immediately.	Bisque overfired; dipping too slow and/or glaze too thick.	Use faster dipping action or add more water to bring glaze back to preferred consistency (generally that of skim or low-fat milk).

SY 543 White Brocade

Slight crazing. Applied too heavily on large area. No remedy.

S'Y 546 Snow

Base color leaks through. Too thin an application of Snow or base glaze applied too heavily. Apply a heavier coat of Snow and refire.

Greying of color. Under-fired Snow. Refire to proper cone.

SY 547 Wax Resist

Beading over design areas. Excess color not removed before firing. Future remedy: Remove excess color by pouncing with dampened sponge before firing.

Dry and black in jar. Product has been frozen and is destroyed.

SY 548 Mask 'n Peel

Dry and black in jar. Product has been frozen and is destroyed.

Mask peels off in layers. Applied too heavily so mask is dry on surface but not underneath. Future remedy: Apply 1 good coat and allow to dry thoroughly before proceeding with technique.

Metallics — Bright Gold and White Gold

Crazing. If crazing has sharp lines and spider-web appearance, it is in the metallic and was caused by too hot a firing. Future prevention: Make sure metallic is fired to witness cone 019.

If crazing is long and in just a few lines, the metallic was applied too heavily. Do not overapply.

Dull, smoky or cloudy appearance.

Application too heavy.

Too much metallic applied to



Possible Problems by Color Family

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Solutions

Problems

Causes

Allow 1' to 2" between pieces in a metallic firing.

Fire metallic off at witness cone 06. Do not reapply metallic.

Future prevention: Allow adequate ventilation around all ware in kiln.

Follow proper firing procedures to prevent thermal shock.

If ware has not been fired, try to touch up area. (If even coverage is not obtained, remove metallic with Essence, wash ware, let dry and reapply.)

Edges of ware crack in overglaze firing.

Defective ware has become weaker with each firing.

Ware was placed too close to peephole or side of kiln.

Fish eyes (circular separations in metallic, exposing underlying glaze).

Dust or lint on wet metallic surface; grease, oil or moisture droplets on ware or in brush.

Too thin

Too thin an application of the metallics.

Apply more metallic and refire.

Metallic rubs off easily.

Too cool a firing.

Apply more metallic and fire to witness cone 019.

Ware cracks sharply all the way through.

Thermal shock.

Always stilt ware prior to overglaze firing.

Lusters — Mother-of-Pearl

Powders off.

Applied too heavily.

Rub off with soft cloth, reapply 1 light coat of Mother-of-Pearl and refire to witness cone 020.

Turns brown in one area.

Fired too close to open kiln peephole.

Refire to witness cone 020, being sure to stilt piece and place it away from peephole.

Frosted look.

Fired too hot.

Fire off at a witness cone 06. Reapply new coat of Mother-of-Pearl. Fire no hotter than witness cone 020.

Purple or blue shadows or smudges.

Contamination in the Mother-of-Pearl.

Fire Mother-of-Pearl to witness cone 06 to remove, then reapply and refire. (Make sure brushes are clean.)

School and Institution Ceramic Supplies

For those of you who have occasion to teach ceramics in schools and institutions, and who must deal with the new legislation regarding art supplies, Duncan has developed a new line of nontoxic glazes.

All Duncan nontoxic products are identified by the AP nontoxic seal on their labels.



The AP Approved Product Seal of The Art and Craft Materials Institute, inc. appears on the label of each jar of Duncan glaze, underglaze, nonfired color and accessory product which has been certified nontoxic.

You can find these products on the shelves of your-usual Duncan ceramic product supplier. For extra convenience, Duncan has prepared a catalog of ceramic supplies which meet the special needs of schools and institutions.

Nontoxic Glazes

Characteristics

Duncan's improved nontoxic technology has produced glazes that perform better than any other nontoxic product line in existence. They are formulated to offer the same fine brushing properties as conventional glazes. These nontoxic glazes perform as well as conventional glazes when applied to true witness cone 04 bisque; however, since many ceramists are not always careful to use shelf cones, some nontoxic glaze labels carry directions for application to witness cone 03 bisque as an extra safeguard against crazing. (Among the exceptions, of course, are the Crackletones, which are applied to cone 06 bisque.)

Note: It is more important than ever for ceramists to be sure to read the label before using the product.

Application

Nontoxic products are applied in the usual manner, per label instructions.

Firing

Fire nontoxic glazes to witness cone 06 to bring out their full beauty. Nontoxic glazes are not as forgiving of improper firing as other glazes.

On stoneware

For high-fire color results of Duncan glazes and underglazes on cone 6 stoneware, refer to the high-fire section of the Color Selection Guide included in the *Duncan Ceramic Supplies for Schools and Institutions Catalog*.

Variety

Duncan nontoxic products include members of the following glaze families: Art, Crackleton, Crystallone, Dimensions, Gallery Opaque, Gloss and the new Stonewashed Glazes, as well as a Lo-Sheen and several Special Effect Glazes; all Duncan underglazes; and the nonfired colors and accessories which are not solvent-based. This wide selection gives schools and institutions the variety and versatility they need for their ceramics programs.

Note: The following underglazes tend to fade or go bluish under the nontoxic Eggnog Art Glazes: EZ 007 Old Rose, EZ 007 Royal Purple, EZ 008 Ruby Red, EZ 020 Mulberry, EZ 027 Clark Orchid, EZ 030 Rose, EZ 040 Plum Blossom, CC 737 Regency Purple, CC 738 Wisteria, CC 739 Orchid, CC 140 Morocco Red, CC 746 Purple, CC 151 Rose, CC 160 Deep Purple and CC 772 Plum Blossom.

Safety Recommendations

Common sense about personal hygiene and safety should still be the rule. Nontoxic formulations require just as much care in cleanup and maintenance of the work area, and in personal cleanliness.

Primary schools (often referred to as K-6 schools; kindergarten through

sixth grade), nursing homes and mental-care facilities have a common factor: they serve individuals who require supervision and who are not always capable of following safety guidelines.

For this reason, Duncan strongly recommends that dealers, studio owners and teachers sell only nontoxic products to K-6 school, nursing home and mental-care facility accounts.

Duncan Ceramic Supplies for Schools and Institutions Catalog



This catalog, directed toward the needs of schools, institutions, hospitals, military installations and correctional facilities, includes a Color Selection Guide which shows Duncan products in full color on both low-fire ceramic and high-fire stoneware.

In addition to much other valuable information, it contains five illustrated elementary school lesson plans created and developed by Phyllis Scott Johnson, Visual Arts Resource Specialist for the Clovis, California Unified School District and winner of the Outstanding Elementary Art Educator in California Award.

The catalog also provides informative sections on the ceramic tools, brushes, videos, kilns and clay kits which are of great utility and value for ceramics programs in schools and institutions.

The Duncan Ceramic Supplies for Schools and Institutions Catalog is designed to be a helpful guide and timesaver for art educators and institutional program directors in selecting the most suitable ceramic supplies. It is available from your Duncan Distributor.

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Glossary of Ceramics Terms

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Absorption — Degree of moisture which will soak into plaster when casting, or into bisque when glazing or decorating with **nonfired** colors.

Accenting — Emphasizing an area with lighter or darker colors, by shading or outlining.

Add-Ons — Greenware parts added to main casting. (Example: handles to cups.) (See **Stick-Ons**)

Adherence — Ability of a glaze, underglaze or **nonfired** color to stay in place on a given surface.

Aging — Letting newly mixed casting slip set, undisturbed, for several days. During this aging period, all the materials will become properly blended and produce the best casting qualities.

Airbrush — Small spray gun used for applying glazes, underglazes or **nonfired** colors. Also used for shading and general decorating.

Alumina Hydrate — A mineral which, in a powder form, prevents porcelain greenware articles that touch from fusing together during firing or adhering to kiln shelf.

Antique Glazes — Trade name of glazes with a frosted look and **variance** of color tones.

Antiquing — Removing applied color to accentuate detail.

Appliqué — Applying material such as lace, string, grog, etc., to ware; name of a type of ceramic add-on.

Art Glazes — Trade name of glazes which produce a blend of colors within themselves.

Banding — Applying color to ware in decorative bands.

Banding Wheel — A hand-operated turntable used to apply or blend bands of color and to accomplish other types of decorating.

Bar, Pyrometric — (See **Cone**)

Binder — Material added to hold ceramic ingredients together, such as gum arabic.

Bisq-Stain® Opaques — Trade name of **nonfired** acrylic colors for bisque ware. Can also be used for accenting pattern in **Crackletone Glazes**.

Bisque — Fired, unglazed objects of clay. **Hard bisque**, witness- cone 04 or higher; **soft bisque**, witness cone 06.

Blistering — Broken bubbles on fired glaze surface.

Blunger — A container, with agitator, for mixing slip.

Body — Term used to describe any formula of clay.

Bone China — Articles made from a clay body that includes bone ash for translucency and strength.

Bone-Dry — Term used to describe greenware that is completely dry, containing no free moisture.

Brocade Glaze — Trade name of a nonflowing glaze that is applied with a tool or brush for raised designs.

Brocade Satin Base Glaze — Trade name of a warm, medium-yellow glaze used as a foundation for **Brocade** designs and metallic overglaze, such as gold, silver, copper, etc.

Butting — Term used to describe placement of two or more glazes in close proximity on the same piece. The second glaze is applied so that it comes within the width of a pencil-point line of the first glaze but does not touch it. If the glazes accidentally touch, the area is scraped clean with a cleanup tool, then retouched. The butting technique prevents glazes from flowing together during firing.

Casting — The process of filling a plaster mold with casting slip, thus creating a clay object.

Casting Slip — Liquid clay for mold casting.

China — Special type of high-fire clay body which has a translucent quality.

Clay Carbon — Carbonless paper for transferring designs onto greenware or bisque.

Cleaning Greenware — Removal of mold seam lines and imperfections from unfired clay objects. (See **Greenware Preparation**)

Cleanup Tool — A tool used to clean greenware.

Cone or Bar, Pyrometric —

Heat-measuring device used when firing a kiln. A bar or a three-sided pyramidal form made of ceramic materials which react to time and temperature in the same way ceramic ware does in a kiln.

Confetti Glazes — Trade name for a type of **Crackletone Glaze**.

Cover-Coat@ — Trade name of opaque underglazes used for full color coverage. Also used for decorative purposes.

Crackletone Glazes — Trade name of glazes which have been especially formulated to produce a delicate "crazed" surface pattern.

Cratering — Moon-like craters on a glazed surface.

Crawling — Term used to identify a glaze defect in which the glaze pulls away or crawls from the bisque.

Crazing — Hair-like cracks which appear on a fired glaze surface. Often referred to as either immediate or delayed crazing.

Crevice — A recessed area of greenware or bisque.

Crystal Clear Glazes — Trade name for a type of **Crackletone Glaze**.

Crystals — Specially formulated colored glazes that have been fired and then ground to various sizes.

Crackletone Glazes — Trade name of glazes combined with crystals which melt in the firing to form interesting patterns.

Debut Brushes — Trade name of Duncan Takion brushes.

Decal — A picture or design, printed with ceramic colors (underglaze or overglaze) on special paper, which can be transferred to the surface of the ware and fired for permanency.

Decorating Wheel — (See **Banding Wheel**)

Decoupage — A process whereby a cut-out design is applied to ware after which the ware receives several coats of lacquer or sealer.

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Glossary of Ceramics Terms

Deflocculent — An alkaline substance added to slip to increase flowing qualities without increasing water content.

Design-Coats™ — Trade name of versatile underglazes which can be used on greenware or bisque.

Dimensions Textural Glazes — Trade name for opaque glazes with a slight matte texture and tiny gloss crystals that create a two-dimensional effect; can be applied to greenware or bisque.

Dinnerware Safe — Term used for a glaze which complies with the Food and Drug Administration's safety requirements concerning lead and cadmium release when properly fired to witness cone 06.

Dip 'n Done™ Glazes — Trade name of glazes developed for fast and easy production of finished ware.

Dipping — Coating an object with liquid glaze by immersion in a container of glaze.

Discovery Brushes — Trade name of a line of Duncan brushes.

Dot Makers — Duncan tools that provide various tips for stamping dot designs. Can be used with both underglazes and nonfired colors.

Drybrushing — Effect achieved by applying color very lightly with an almost dry brush.

Dryfooting — Leaving the bottom area of an article unglazed so stiling is unnecessary. Not recommended for utility items.

Dunting — Breaking away of clay body during firing, due to trapped air or foreign substance.

Earthenware — Nonvitreous ware made from low-fire clays.

Element — A high-temperature resistance wire wound in a coil that carries electrical current for heating kiln.

Elephant Ear — Fine-grained, thin sponge.

Embossed — A raised design.

Enamelware Glazes — Trade name for a type of Crystaltone Glaze.

Energy-Saver™ Kilns — Trade name of certain Duncan Kilns.

Engobe -- Colored slip or clay. Also the term used when decorating an unfired clay object with colored casting slip or liquid clay.

E-Z Stroke® — Trade name of highly concentrated translucent underglaze colors for detail work, linework, color washes, etc..

Ferrule -- Metal band of brush to hold hairs or bristles in place.

Fettling Knife — Tool used to remove excess clay from the outside of the mold and from the mold pour hole.

Fired Antique — Trade name of antiquing underglazes for antiquing, design work and shading on bisque.

Firing — The process of maturing ceramic products by various degrees of heat.

Firing Chamber — Inside area of kiln.

Firing Cone — (See "Firing Basics")

Flash Casting — Cleaning a mold by making a thin casting with a different slip to pick up any traces of the last-used clay body.

Flow — The term used when referring to the running or moving qualities of a glaze.

Flowing Coat — A coat of glaze applied with a well-loaded brush, so that the brush does not-drag against the surface of the ware.

Flux — Any substance added to clay or glaze to lower maturing temperature.

Foot — Bottom of ceramic item.

Free Form — Shape with no uniformity.

Froth -- Trade name of a lava-type glaze.

Furniture — Articles necessary to use full capacity of kiln space. Shelves, posts and stilts.

Gallery Opaque Glaze — Trade name of a family of opaque glazes.

Glaze — A fired finish consisting of a prepared mixture of frit which produces a glass-like surface when fired.

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Glaze Brush — A brush with full, long hairs for application of glaze and opaque underglaze

Glaze Crystals — Trade name of crystals that can be added to Duncan glazes.

Glazes, Nonflowing — (See Nonmoving Glazes)

Gloss Glaze — Shiny glaze.

Graining — To create a wood-grained effect by incising greenware, using Woodtone Glazes or drybrushing nonfired colors.

Greenware — Unfired clay articles.

Greenware Drill — A small tool with a threaded point used for drilling holes in dry greenware. (See "Ceramic Tools")

Greenware Preparation — Removal of mold seam lines and imperfections from unfired clay objects. (See Cleaning Greenware)

Greenware Saw — A small tool with a serrated edge used for cutting dry greenware. (See "Ceramic Tools")

Grit Cloth — An abrasive cloth for cleaning greenware or bisque.

Grit Sponge — A square sponge with an abrasive surface on one side.

Grog — Ground-up bisque added to clay to reduce shrinkage and add strength. Sometimes changes texture and color.

Guard Cone — (See "Firing Basics")

Guide Cone — (See "Firing Basics")

Hard Bisque — Ware that has been fired to witness cone 04 or hotter.

Hard Spots — Areas which will reject color, and cause piece to have bare spots. Can be caused by oversponging greenware, but is generally caused by improper greenware casting.

High-Fire — Refers to ceramic articles or glazes which are fired to witness cone 4 or higher (stoneware and porcelain).

Hydrometer — Device to measure density of liquids.

Immature Bisque — Ware that has been fired cooler than witness cone 06.

Glossary of Ceramics Terms

Impervious — Impenetrable; often used as another term for waterproof.

Incising — To cut clay surface to create design.

Incompatible colors — Ceramic colors unsuitable for use together because of unbalanced chemical effects.

Kaolin — A clay used in certain clay bodies for whitening. Main ingredient in porcelain.

Kiln — A heating chamber for hardening and maturing clay and glaze.

Kiln Furniture — (See Furniture)

Kiln-Sitter — A mechanical device triggered by a small cone that shuts off the kiln.

Kiln Wash — A coating used on the tops of kiln shelves and kiln floor to protect them from glaze drippings.

Kilns for the Home — Trade name of Duncan 110-120V Kilns.

lace Tool — Long, pointed tool for use in applying lace.

Leather-Hard — Term used to describe cast or hand-formed clay items that are damp but firm enough to handle without losing shape.

liner Brush — A brush with long, pointed hairs for fine lines and design work.

Loading — To completely fill brush with color.

Lo-Sheen Glazes — Trade name of glazes with matte or semiglossy finishes.

Luster — An overglaze that imparts an iridescent surface to the ware.

Majolica Technique — Underglazes Applied in design over an unfired **nonmoving glaze**. After the glaze firing, the design is a permanent part of the glaze surface.

Mask 'n Peel® — Trade name of water-soluble emulsion used to protect design areas on **greenware** or bisque.

Maturing Point — Temperature needed to mature glaze or clay.

Mending — Repairing broken **greenware** or bisque.

Modeling Clay — Prepared clay for hand modeling.

Mold — A hollow plaster-of-paris form in which articles are reproduced through the use of liquid clay (slip).

Mold Keys — Matching parts on each mold section that align mold properly for casting.

Muffle — Heat-conducting pieces of pipe around firing chamber of gas kiln.

Nichrome — A heat-resistant type of wire.

Nonmoving Glazes — Glazes that move very little in the glaze firing.

Opaque — Nontransparent color.

Overglaze — A decorative finish applied over a fired glaze surface and made permanent by firing.

Palette Knife — A flexible knife with no sharp point.

Pat — Gently touching color to desired areas of ware with brush or cloth, in an up-and-down motion.

Patch-A-Tatch® — Trade name of a mender for welding broken greenware or bisque.

‡ **Pinholes** — Tiny holes penetrating a glazed surface. A glaze defect caused by **underfired** bisque, applying glaze to **greenware**, **firing** too rapidly or **poorly deflocculated** casting slip.

Plasticity — Pliability of modeling clay.

Pooling or Puddling — Fired glaze which has run to the bottom or puddled in detail of ware.

Porcelain — A vitrified clay body that matures at a high temperature and is translucent.

Porosity — The permeability of fired or unfired clay.

Posts — Columns of refractory material used to support shelves inside the kiln. (See Furniture, Kiln)

Potter's Wheel — Revolving wheel driven by hand, foot or **electric** power, used in forming articles from clay.

Pottery — Articles formed from clay.

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Pouncing — Applying color to ware with quick upanddown movements, using a brush or a sponge.

Pouring — (See Casting)

Pouring Sprue — A term for the excess clay around a mold's pour hole which is trimmed away before opening mold. (See Spare)

Project Finishers — Trade name of Duncan mold accessories used to complete ceramics projects.

Pyrometer — An instrument which indicates temperature in the kiln.

Red-Coat® — Trade name of opaque underglazes in true reds, oranges and yellows.

Red-Stroke® — Trade name of translucent underglaze³ in true reds, oranges, yellows and greens.

Red-Stroke® Clear Glaze — Trade name of a glaze especially formulated for use over Red-Stroke translucent underglazes.

Refractory — Heat-resistant material.

Rolling Consistency — Consistency to which glazes are thinned for rolling inside ware: milk consistency for 2-coat glazes; light-cream consistency for 3-coat glazes; cream consistency for 4-coat glazes.

Rolling Glaze — Method of covering inside area of ware, by rolling thinned glaze inside, then pouring out excess.

Rouging — Applying opaque or translucent nonfired colors with a cloth, over an opaque base coat.

Running — Refers to fluidity of a glaze at the point of maturity before cooling and hardening.

Safety Timer — A shut-off device designed to turn the kiln off if the kiln-sitter fails to do so.

Score — To scratch tiny crisscross lines on areas of greenware that will be fastened together with Duncan's Patch-A-Tatch or clay slip.

Scrubbing — Applying an initial priming coat of thinned opaque underglaze or glaze, or partially removing fired metallic overglaze from ware.

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Glossary of Ceramics Terms

Seam — Ridge formed in greenware where mold pieces join.

Seep — The leaking of fluids through fine cracks or openings.

Sgraffitoing — A method of creating a design by gently scratching through applied color to reveal the color or the clay body beneath it.

Shelf Support — Same as posts. (See Furniture, Kiln)

Shelves — Flat slabs of special high-temperature materials on which ware is placed inside kilns. (See Furniture, Kiln)

Shivering — Occurs when the glaze or underglaze and the clay body are incompatible. The clay body shrinks more than the color, causing the color to peel or break away from the body after firing.

Shrinkage — Reduction in size of a clay object as a result of firing.

Signature Brushes — Trade name of Duncan 100% pure red sable brushes specifically designed for use on ceramics.

Silk Sponge — For decorating; recognizable by short hairs over entire sponge.

Slip — Clay in liquid form.

Slip Trailing — Using slip in an applicator to flow on design.

Smoking — Greying or discoloration of a glaze, caused by underfiring.

Soaking — Holding the temperature in the kiln chamber for a longer period, of time than usual.

Soft Bisque — Ware that has been fired to witness cone 06-05.

Solvent — A dissolving agent used in antiquing and to clean brushes used with oil-based translucent colors.

Spare — A term for the excess clay around a mold's pour hole which is trimmed away before opening mold. (See Pouring Sprue)

Spattering — Method of applying small flecks of color to ware.

Sponging — Use of sponge instead of brush to apply colors directly to surface of ware or over a base coat.

Stagger — To separate successive coats of glaze by fractions of an inch to prevent glazes from flowing together or from dripping off base of ware in firing.

Stencil — Paper perforated with design through which color can be brushed or sponged onto a surface.

Stick-Ons — Greenware parts added to main casting. (Example: handles to cups.) (See Add-Ons)

Stilts — Supports used to separate a glazed article from a shelf during firing. (See Furniture, Kiln)

Stippling — A method of applying color by pouncing the tip of a brush loaded with color against the ware.

Stoneware — A heavily grogged clay body requiring a high firing to vitrify.

Stonewashed™ Glazes — Trade name for nontoxic, dinnerware-safe semiopaque glazes that simulate stoneware looks.

Suspension Agent — Chemical added to keep glaze ingredients from separating.

Template — A pattern or guide used in shaping a clay form.

Terra-Cotta — Natural low-fired clay. Also a color.

Texture — Planned surface finish or roughness produced for interest.

Thermal Shock — Subjecting the ware to abrupt changes from hot to cold or vice versa.

Tint — To lightly apply diluted colors over a base coat or coloring a product with another product.

Tipping — Touching tip of loaded brush with other colors for muted shading or accenting.

Translucent — Transparent, allowing color underneath to show.

Underglaze — A ceramic color used under a glaze.

Utility Items — Dinnerware, cups, canister sets — functional rather than purely decorative items.

Vent Holes — Small holes made by piercing greenware when attachments have been made to allow trapped

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gases and moisture to escape from attachments during bisque firing.

Versatite Underglazes — Trade name of Duncan Design-Coats underglazes which can be used on greenware or bisque.

viscosity — Resistance to flow.

Vitreous — Impervious surface (waterproof).

Vitrify — To become a stone-hard, impervious surface.

Wash — Color and water solution, used for shading and antiquing.

Waterproof — (See impervious)

Water Smoking — The first part of firing, during which moisture is forced from the clay.

Wedge — To force air pockets and bubbles from modeling clay by rolling it back and forth and from side to side on a flat work surface, applying hand pressure at the same time. A professional wedging table equipped with a wire for cutting the clay to release air bubbles is often used by studios.

Welding — Sealing two clay surfaces together.

Wheel — (See Potter's Wheel)

Witness Cone — (See "Firing Basics")

Woodtone Glazes — Trade name of satin glazes with tiny dark specks which form a wood-grain effect when brushed out.

Wool Sponge — Very open texture and soft when wet.

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WITH GOLD ARE SUBJECT TO THE SAME DISCOUNT SCHE-
MATIC LISTED ABOVE.

NOTES:

DESIGNS ARE A STANDARD SIZE, HOWEVER, SOME ARE
EXPENSIVE AND ARE PRODUCED IN A SLIGHTLY SMALLER
SIZE TO THEIR HIGH QUALITY. THESE ARE CONSIDERED
FULL SHEET.

NOTE: ON OCCASION, TWO (2) HALF SHEETS WILL BE SHIPPED
AS ONE FULL SHEET. THESE WILL BE STAPLED TOGETHER.

DISPLAY BOX, COMPLETE WITH DIVIDERS, FOR A PURCHASE
OF 10 OR MORE SHEETS. REGULAR PRICE FOR DISPLAY BOX \$30.00.

WE APPRECIATE YOUR BUSINESS!!

K-CERAMIC IMPORTS

JOHN KOUTOUZIS, OWNER

* Retail with star (*) retail at \$8.50

** Retail with stars (**) retail \$10.00

930907CWE7271

CRYSTAL SHEET APPLICATION

PLEASE READ ALL-INSTRUCTIONS BEFORE BEGINNING !!!!!

1. 'APPLY NORMAL FULL COLOR DECAL IN THE REGULAR MANNER. ALLOW TO DRY OVERNIGHT.
2. DAMPEN THE APPLIED BUT NOT FIRED DECAL. PLACE THE CRYSTAL SHEET INTO WATER AS WITH ANY DECAL. WHEN THE CRYSTAL DESIGN WILL SLIDE OFF THE PAPER APPLY THE CRYSTAL SHEET DIRECTLY OVER THE REGULAR DECAL. USE NO SPONGES, SQUEEGIES OR PRESSURE OF ANY KIND, IT IS NOT NECESSARY. ALLOW TO DRY OVERNIGHT.
3. FIRE IN THE UNSUAL MANNER. 2 HOURS ON LOW WITH THE LID CRACKED. 2 HOURS ON MEDIUM WITH THE LID CRACKED. CLOSE THE LID AND FIRE TO A TEMPERATURE OF 1620 DEGREES FAHRENHEIT OR TO A CONE OF .013

HOW A DECAL SHOULD BE APPLIED:

BE CERTAIN THAT THE SURFACE OF APPLICATION IS CLEAN.' CAREFULLL CUT THE DECAL FROM THE SHEET WITHOUT CUTTING INTO THE DESIGN. PLACE THE DECAL INTO WATER. THE DECAL WILL CURL UP AND THEN UNCURL. AT THIS POINT REMOVE THE DECAL FROM THE WATER. LAY THE DECAL ON A FLAT SOLID SURFACE WHEN THE DECAL CAN BE MOVED AROUND ON THE PAPER IT IS READY TO APPLY. CAREFULLY SLIDE THE DECAL FACE UP ONTO THE PIECE ON SLIDE INTO PROPER POSITION. WIPE THE DECAL WITH A SOFT SPONGE TO REMOVE EXCESS WATER. TO ASSURE GOOD ADHERENCE REMOVE THE EXCESS WATER FROM THE DECAL WITH A SQUEEGIE. STARTING IN THE CENTER OF THE DESIGN SQUEEGIE TO THE EDGES FROM THE CENTER. BEING CAREFUL TO REMOVE ALL THE WATER FROM UNDER THE DECAL. BE SURE TO KEEP THE SQUEEGIE ITSELF WET SO THAT YOU DON NOT TEAR THE DECAL.

ALLOW THE DECAL TO DRY COMPLETELY TO BE CERTAIN THAT ALL OF THE MOISTURE HAS BEEN REMOVED FROM THE DECAL PRIOR TO FIRING.

POINTS TO REMEMBER WHEN FIRING DECALS:

1. CERAMIC DECALS ARE TO BE APPLIED OVER FIRED GLAZED SURFACES.
2. THE DECAL MUST FIRMLY ADHERE TO THE SURFACE OF THE PIECE.
3. CERAMIC DECAL FIRING: RANGE: CONE .015 to .017 (1475-1375) DEGREES FAHRENHEIT.

GLASS DECAL FIRING RANGE: CONE .020 to .022 (1175-1090) DEGREES FAHRENHEIT.

4. THE DECAL KILN SHOULD BE WELL VENTED.
5. IF FIRED GOLD, PLATINUM OR OTHER METALLIC OR LUSTRES ARE TO BE USED ON DECALED CERAMIC PIECES THESE MATERIALS SHOULD BE APPLIED AFTER THE DECAL HAS BEEN FIRED.

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The enclosed information was gathered from a variety of sources. It does not necessarily reflect the opinions or official policies of NIOSH.

Health hazards of working with ceramics

Recommendations for reducing risks

Laurence J. Fuortes, MD

Preview

Exposure to many of the substances used in ceramics studios and factories poses a potential health threat to ceramics artists. Unfortunately, these artists and their physicians often are unaware of the potential dangers in handling such materials. In this article, Dr Fuortes discusses the hazardous substances and unsafe practices in this type of work and recommends protective measures to reduce health risks.

Ceramics artists and their physicians need to be aware of the health hazards of working with ceramics. According to anecdotal reports, symptoms suggestive of chemical irritant bronchitis or occupational asthma are quite prevalent among ceramics artists.

Potential hazards

Although a number of ceramics-related health hazards are well documented, artists are not uniformly aware of the dangers associated with the use of traditional and newer glazes or exposure to kiln emissions.

COMPONENTS OF CLAYS AND GLAZES—Many of the raw materials in clays commonly used by ceramics artists are fibrogenic and confer a risk for pneumoconiosis when inhaled. These largely inert, seemingly benign substances have little potential for acute toxicity. However, exposure to fibrogenic clay compounds is associated with various pulmonary diseases (table 1).¹⁻⁴

Mineral-caused lung diseases are insidious and often go undetected until they are far progressed. Subclinical stages of these diseases can be detected by radiography, lung volume determinations, and testing of gas diffusion capacity. Silicosis and silicotuberculosis have been well described as occupational hazards in workers in the United Kingdom's pottery districts since the 1800s.⁵ Recent studies confirm continued high exposure to dust in the industry⁶ and increased death rates from both nonmalignant respiratory disease and lung cancer among industrial potters.⁷⁻⁹ Talc pneumoconiosis is also a risk because the talc used to make porcelain is occasionally heavily laden with asbestos.

In the early 1700s Bernardo Ramazzini wrote the book *De Morbis Artificum*,¹⁰ in which he described lead poisoning and consumptive lung disease in potters. Because lead has been proved to be extremely toxic,

many developed countries now have strict regulations on the use of lead glazes in industry. As a result of such regulations, lead poisoning, which affected about 200 potters a year in England at the turn of this century, was virtually eliminated by the mid-1950s. However, ceramics artists and hobbyists in these countries, who are not covered by such regulations, continue unwittingly to place themselves and others at risk.

In countries that have no regulations, lead poisoning from glaze materials continues to be a problem for persons who create or use ceramic objects.¹¹⁻¹³ For example, potters in Third World countries still commonly use lead glazes. Recent studies confirm lead toxicity not only in these artisans but also in their children and neighbors as a result of exposure to lead dust.^{14,15} Worldwide, several cases of severe lead poisoning from the use of lead-glazed earthenware, including the death of one child, have been reported.^{16,17} Acidic foods and liquids have the greatest propensity for leaching lead from these wares.

In addition to using traditional practices, potters are developing innovative techniques involving new materials with uncharacterized toxicities. The hazards of exposure to some of the most

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Many of the raw materials in clays commonly used by ceramics artists confer a risk for pneumoconiosis when inhaled.

Table 1. Clay components and associated pulmonary diseases

Clay component	Disease
Alumina	Aluminosis (lung disease)
Asbestos (contaminant of talc)	Asbestosis, cancer of several sites
Diatomaceous earth (raw material for clay)	Silicosis
Feldspar	Pneumoconiosis
Iron oxide	Siderosis
Kaolin (raw material for China clay)	Kaolinosis
Talc (raw material for porcelain)	Talcosis, lung cancer
Barium carbonate	CNS disease, baritosis (benign pneumoconiosis)

Table 2. Common glaze components and associated hazards

Glaze component	Hazards
Arsenic trioxide	Heavy metal poisoning, cancer
Antimony trioxide	Heavy metal poisoning
Beryllium	Pneumonitis, pneumoconiosis
Boric acid	Skin irritation, CNS depression
Cadmium oxide	Heavy metal poisoning
Calcium carbonate	Nonspecific
Cobalt	Sensitization of skin and lung, cardiomyopathy
Copper	Nontoxic unless in form of copper sulfate-verdigris
Chromates (nickel, iron, potassium)	Sensitization (dermatitis, asthma, pulmonary fibrosis), cancer
Lead	Heavy metal poisoning
Lithium carbonate	CNS and renal toxicities
Manganese dioxide	CNS toxicities (parkinsonism)
Nickel oxide	Sensitization, cancer
Platinum dioxide	Benign pneumoconiosis
TiO ₂ oxide	Benign pneumoconiosis
Zinc oxide	Dermatitis, metal fume fever

common glaze components are listed in table 2.^{1-4,18}

KILN EMISSIONS—Although there are no published reports of ill effects attributable to exposure to kiln emissions, anecdotes of kiln malfunction and resultant exposure to toxic irritants are numerous. Kilns are often placed in reduction (a state of relative oxygen depletion), being fired under back pressure, to bring out subtle colors of various glazes. Because carbon monoxide forms as a result of incomplete combustion, the potential for its accumulation is greatest during the reduction phase. Nitrogen dioxide and nitric oxide are by-products of natural gas combustion. Depending on the firing technique, metal fumes from glaze components may be emitted, and exposure to other irritants may occur.

Chemical irritants such as sulfur dioxide and suspended particulate often have an acute synergistic effect on pulmonary functions.¹⁹⁻²¹ Sulfur dioxide is an expected kiln emission from the initial, or bisque, firing of clay. Concentrations vary, depending on the quality and sulfur content

Laurence J. Fuortes, MD

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Ceramics artists may excessively expose themselves and their families to metallic glaze dusts (eg, lead) by working and living in the same quarters.

of the clay. Permissible levels of exposure to airborne contaminants without adverse effects are defined as threshold limit values. The threshold limit value for sulfur dioxide is about 2 ppm. In crafts studios, sulfur dioxide levels in the range of 2 to 8 ppm often have been documented.²²

Table 3 lists the threshold limit values of irritants that may be found in poorly exhausted kiln emissions.

Protective measures

A typical ceramics studio is dusty because both clays and glazes are usually stored and mixed in a dry, powdered form (figure 1). Whenever possible, glazes should be stored in liquid or slurry form to minimize dust exposure and should be applied by dipping or brushing, not spraying. Ventilation of the work area must be sufficient to exhaust local production of any toxic substances and to ensure proper functioning and exhaustion of kilns.

Risks may be reduced by use of appropriate personal protective clothing and devices, including gloves, overalls or aprons, and respirators. Stringent personal hygiene measures are essential, including frequent handwashing and refraining from smoking, eating, or storing food in the area used for pottery making. Ceram-

continued

Table 3. Threshold limit values of kiln emissions

Emission	Threshold limit value
Carbon monoxide By-product of incomplete combustion Significant exposure possible during reduction phase of firing	35 ppm
Chlorine gas By-product of salt glaze process	1 ppm
Hydrochloric acid vapor By-product of salt glaze process	5 ppm
Infrared radiation Significant exposure when cones are inspected through ports	NA
Nitrogen dioxide By-product of natural gas combustion	5 mg/m ³
Nitric oxide By-product of natural gas combustion	30 mg/m ³
Smoke and soot By-product of raku and smoke pit firings	NA
Sulfur dioxide By-product of bisque firing, especially of high-sulfur clay	2 ppm
Vaporized glaze constituents Various metal fumes	NA
Various hydrocarbons Aldehydes (formaldehyde) Mercaptans	15 mg/m ³

NA, not available.

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Figure 1. Professional potter working in dusty ceramics studio.



ics artists may excessively expose themselves and their families to metallic glaze dusts (eg, lead) by working and living in the same quarters. Thus, work clothing should be kept in the work area and washed often to avoid introduction of toxins into living areas. Dust in the work area should be cleaned up with a wet vacuum or damp mop.

Artisans need to be aware of the hazardous potential of the materials they use. Thus, art materials suppliers should inform their customers of potential hazards, and safety programs should be included in studio arts curricula. All potentially toxic substances should be appropriately labeled and stored to prevent mishaps.

Whenever possible, the more toxic glaze substances (heavy metals and chromates) should be replaced with less toxic materials.

Forthdrawn protection, ceramics artists should take precautions equivalent to those expected in other work sectors when handling toxic and, in some cases, potentially carcinogenic substances.

Summary

Ceramics artists are at risk for pulmonary disease, heavy metal poisoning, and other toxic reactions caused by exposure to clays, glazes, and kiln emissions. Stringent personal hygiene, awareness of hazardous materials, and appropriate safety measures may reduce the health risks of repeated exposures. FGM

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CONSUMER PRODUCT INCIDENT REPORT

Region: WESTERN

1. NAME OF RESPONDENT [REDACTED]		2. (HOME) [REDACTED]	(WORK) none
3. ADDRESS [REDACTED]		4. CITY Gretna	STATE ZIP CODE LA 70056

5. DESCRIBE INCIDENT OR HAZARD, INCLUDING DATA ON INJURIES
 Sons were taken to medical center, Kid West, for a routine physical and were both diagnosed with lead poisoning; sons still suffer from lead poisoning.
 3 year old son has also been diagnosed with a pervasive developmental disorder (organic brain damage) caused by lead poisoning. 6/93
 Environmental sanitation inspector, Frank Allo, from the Environmental
 -cont-

6. DATE OF INCIDENTS 6/93	7. IF INJURY OR NEAR MISS OBTAIN AGE/SEX AND DESCRIBE INJURY: 7 Y/M see narrative	8. IF VICTIM DIFFERENT FROM RESPONDENT, PROVIDE NAME AND RELATIONSHIP [REDACTED] son
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9. DESCRIPTION OF PRODUCT ceramic glaze	10. BRAND NAME Duncan
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11. MFR/DISTRIBUTOR NAME, ADDR. & PHONE Duncan Ceramics unknown unknown, CA 00000 800-Ceramics unknown unknown unknown	12. MODEL, SERIAL NUMBERS GL611, Clear	13. DEALER'S NAME, ADDRESS & PHONE Dell's Ceramics (out of business) unknown New Orleans, LA 00000 504-241-4567
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14. WAS THE PRODUCT DAMAGED, REPAIRED OR MODIFIED? YES NO x IF YES, BEFORE OR AFTER THE INCIDENT? DESCRIBE:	15. PRODUCT PURCHASED DATE PURCHASED 1988 NEW x USED AGE 5 yrs.
	16. DOES PRODUCT HAVE WARNING LABELS? IF SO, NOTE: unknown

17. HAVE YOU CONTACTED THE MANUFACTURER? YES x NO IF NOT, DO YOU PLAN TO CONTACT THEM? YES NO OTHER?	18. IS THE PRODUCT STILL AVAILABLE? YES x NO IF NOT, ITS DISPOSITION	19. MAY WE USE YOUR NAME WITH THIS REPORT? YES x NO
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FOR ADMINISTRATION USE

20. DATE RECEIVED 08/04/95	21. RECEIVED BY (NAME & OFFICE) tca/HL	22. DOCUMENT NO. H9580059A
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23. FOLLOW-UP ACTION	24. PRODUCT CODE(S) 0514
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25. DISTRIBUTION	26. ENDORSER'S NAME & TITLE AJP 9/28/1995
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Narrative Continued

Health Agency inspected consumer's house and said that lead dust and fumes from ceramic glaze produced when firing ceramics in kiln had contaminated whole house; consumer had to evacuate house. Consumer feels that warning label on glaze should state fumes and dust produced by glaze during firing is harmful to children.

6/93 Consumer called and explained problem to manufacturer's customer service rep., (name unknown), who said lead in glaze is in a silicate form and could not have caused lead poisoning and offered no assistance.

6/93 Consumer called and explained problem again to manufacturer's customer service rep., (name unknown), and requested a material safety data sheet on glaze; manufacturer did this 7/93. Consumer found from data sheet that over exposure to lead in glaze through inhalation or ingestion can cause damage to kidneys, central nervous system, and developing fetus. Glaze comes in a hard plastic 40 oz. tube, and in a 1 gallon or 5 gallon hard plastic bucket.

Vict #	Sex	Age	Name	Relationship
2	M	3	Y. [REDACTED]	son

Vict #	Victim Injury Description
2	see narrative

'Distributor phone #: unknown

CPSC Source: WOM

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